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FETAL PAIN

HEARING

BEFORE THE

SUBCOMMITTEE ON THE CONSTITUTION

OF THE

COMMITTEE ON THE JUDICIARY

UNITED STATES SENATE

NINETY-NINTH CONGRESS

FIRST SESSION

ON

THE MEDICAL EVIDENCE CONCERNING FETAL PAIN

MAY 21, 1985

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FETAL PAIN

TUESDAY, MAY 21, 1985

U.S. Senate,
Subcommittee on the Constitution,
Committee on the Judiciary,
Washington, DC.

The subcommittee met, pursuant to call, at 9:40 a.m., in room 430, Dirksen Senate Office Building, Hon. Orrin G. Hatch (chairman of the subcommittee) presiding.

Present: Senators Grassley and Simon.

Also Present: Senator Humphrey.

Staff Present: Stephen J. Markman, chief counsel and staff director; Randall R. Rader, general counsel; Susan Bourne, chief clerk; Diane Stark; clerk, and Lisa Johnson, clerk.

OPENING STATEMENT OF HON. ORRIN G. HATCH, A U.S. SENATOR FROM THE STATE OF UTAH, CHAIRMAN, SUBCOMMITTEE ON THE CONSTITUTION

Senator Hatch. If we can have order.

On January 30, 1984, President Reagan sparked controversy when he stated that "Medical science doctors confirm that when the lives of the unborn are snuffed out, they often feel pain, pain that is long and agonizing."

Again on March 6, 1984, the President said, "As abortions are performed, the unborn children being killed often feel excruciating pain."

These statements catapulted the question of fetal pain to the forefront of national consciousness. Fetology, or the study of the unborn, has introduced significant implications for the question of fetal pain. This science has observed that by at least the 56th day of pregnancy, a fetus can move. Discomfort may occasion the movement. By day 59 or 60, tactile stimulation of the mouth produces a reflex reaction in the unborn child. By day 77, the fetus has developed sensitivity to touch on hands, feet, genital and anal areas and begins to swallow.

In the words of one author, "Beginning with the presence of sense receptors and spinal responses, there is as much reason to believe the unborn are capable of pain as that they are capable of sensation."

By approximately day 91, the entire sensory nervous system in the unborn child functions as a whole in all parts of the unborn's body (except in the skin on the back of the head). At that point, in the words of Dr. Vincent Collins, "It may be concluded with reasonable medical certainty that the fetus can sense pain."

Another development in the science of fetology also has implications for the question of fetal pain and suffering. In recent years, physicians have begun performing corrective surgery on fetuses in utero. When doctors began invading the sanctuary of the womb, they noted that the fetus would react aversively, in a manner characteristic of pain, to their therapeutic activity.

In the words of one medical book chronicling these surgical advances;

> We know the fetus can feel pain. For example, blood can be transfused directly into the abdominal cavity of the fetus by means of a long, thin hypodermic needle. Of course, the obstetrician can see the fetus under the fluoroscope and easily insert the needle without injury to lungs, liver, or heart. Nevertheless, the upper portion of the hypodermic needle, which still protrudes from the mother's abdomen, can be seen moving about, indicating the fetus is trying to escape this slightly painful object.

Thus, observations during surgery on fetuses have added to the body of medical knowledge on this issue.

Another aspect of this question deals with the humanitarian character of our Nation. We are a very humane people. Many of our States and indeed our national legislature have enacted humanitarian statutes to protect animals from undue suffering and pain. For instance, many States have laws regulating the slaughter of cattle to prevent the creatures from suffering undue pain. Many States, for the same reasons, regulate the ways a veterinarian disposes of stray dogs and cats. In other words, our society has gone to special lengths to respect the sensibilities of lower creatures. The President's statements extend that same respect to the sensibilities of members of our own species at an early stage of development.

The dimensions of this question must also not be overlooked. The President's statement notes that abortion may cause unborn children excruciating agony. Each year over 1.6 million abortions are performed in America. More than one-third of these abortions are repeat abortions, meaning the pregnant woman is returning for at least a second operation. Nearly one-half million of these abortions each year are performed after the point in pregnancy when fetologists observe that the unborn child has developed sensory capabilities.

Over 13,000 abortions each year are performed after the fetus is 21 weeks old and may be capable of survival outside the womb. At that stage of development, there is no responsible dissent about the reality of the anguish caused the unborn child by the abortion procedures.

With these implications and dimensions in mind, the Constitution Subcommittee today undertakes an examination of the medical evidence concerning fetal pain. The subcommittee is not undertaking a review of the merits of the recent film entitled "The Silent Scream." That presentation of this controversy has been aired in the public media. Our focus is upon the current state of medical evidence on this complex question.

There is no legislation before the subcommittee today, although the evidence is certainly relevant to several constitutional amendments and bills before this body concerning the right to abortion established by the Supreme Court in the case of *Roe* v. *Wade* in 1973.

One final comment, President Reagan has consistently noted that the benefit of the doubt ought to be given to a fellow member of the human family with respect to questions affecting his or her life and well-being. As the subcommittee weighs the evidence of these outstanding physicians and medical experts today, I will personally keep that perspective and react with great human compassion to the extent any evidence is left unrebutted tending to establish the pain and anguish suffered by unborn children during abortions.

We will begin this morning. We have some excellent witnesses on both sides of this issue today, and our first witness today is to discuss the medical evidence relative to fetal pain, and his name is Dr. Bernard Nathanson. Dr. Nathanson is a board certified gynecologist and practicing in New York City, and is also attending physician at Roosevelt Hospital in New York. He also possesses teaching credentials at Cornell University Medical College.

Prior to the infamous *Roe* decision of the Supreme Court, Dr. Nathanson was chairman of the Medical Committee of the National Association for Repeal Abortion Laws, later named the Abortion Rights Action League. From February 1971 to September 1972, he was director of the largest abortion clinic in the Western World. Since then, however, his studies of fetology have led him to author two books: "Aborting America," and the "Abortion Papers."

The subcommittee welcomes one of the leading authorities on the subject of abortion and fetal pain. Dr. Nathanson, we will allow you to take the chair, and we will be happy to take your testimony at this time. Welcome to the committee. This should be a most interesting hearing, and we look forward to hearing what you have to say.

STATEMENT OF DR. BERNARD NATHANSON, M.D., NEW YORK, NY

Dr. NATHANSON. Thank you very much, Senator.

This morning we propose to present some video tapes made of a 12-week abortion in progress. As you may know, these tapes are part, or at least selected portions of these tapes as part of the film you alluded to earlier, "The Silent Scream."

There has been a great deal of controversy and many criticisms of those tapes, or at least the portions shown in that film, and we chose to present the complete unedited, raw, unedited video tapes of that abortion from beginning to end. Some of the criticisms made of the film have been, I believe, adequately answered. The age of this child is well established now at 12 weeks by measurements by various ultrasound experts, and we have to resolve all remaining doubts an affidavit from Dr. Ian Donald at the University of Glasgow in Scotland. Dr. Donald is the world's leading authority on the use and interpretation of ultrasound, and in fact was the inventor of clinical ultrasound, and on February 23, 1985, gave us this affidavit in which he indicates that he has studied these video tapes four times and concludes that they are, and I quote, "Not faked nor the result of artifact, intentional or otherwise."

We have, for those interested, a picture of Dr. Donald signing the affidavit on that date.

Senator HATCH. Without objection, with your permission, we will make both of those a part of the record at this point.

[The documents follow:]

COBBLERS ROW.
EAST END.
PAGLESHAM.
ROCHFORD.
ESSEX. SS4 2ER
TEL. 037-06-616

I, the undersigned Ian Donald of the above address and formerly Regius Professor of Midwifery at Glasgow University from 1954 until 1976 and thereafter Honorary Obstetrician at the Western General Hospital Edinburgh until 1981 and Honorary Research Consultant at the National Maternity Hospital Dublin, having had experience in the development and exploitation of Diagnostic Ultrasound, particularly in Obstetrics from 1955 onwards until 1981, the last four years of which were much taken up with filming fetal activity at various stages of pregnancy, particularly the first half thereof, have now studied Dr Nathanson's video-tape film entitled "The Silent Scream" not less than four times and affirm that Iam of the opinion that the fetal activities depicted by ultrasonic real-time scanning in this film are not faked nor the result of artefact intentional or otherwise

23rd February 1985.

Ian Donald, C.B.E., M.D., D.Sc., F.R.C.O.G., F.R.C.S.(Glasg) Hon F.A.C.O.G.

Witness.

Sworn by Ian Donald
this 23rd February 1985
at Paglesham ~~Essex~~

B K Bishop
A Solicitor
Hockley, Essex.

Ian Donald, M.D., of Southeast England, right, developer of the ultrasound technique, signs an affidavit affirming the authenticity of "The Silent Scream." Dr. Donald is considered the world's greatest living expert on ultrasound. Witnessing his signature is G. Bishop, a Southeast England attorney.

Dr. **NATHANSON**. We might then begin the showing of the video tape. I should remind all observers, incidentally, and it is key, that this abortion was done under general anesthesia. This woman was fast asleep, felt nothing. You can observe for yourselves the agonies the child goes through. I will refrain from any comments other than those which may be appropriate within terms of the technique being used during the abortion.

Senator **HATCH**. Would you kindly point out the fetus, and help us to understand this movie?

Dr. **NATHANSON**. Yes, I will.

[Film shown.]

Dr. **NATHANSON**. Simply to orientate you, this is the head of the child here, this body here. This black material in the background is amniotic fluid. We have not commenced the abortion yet. We are looking at the child. The heart is beating right here. This black spot here is the eye of the child, and the placenta is right up here.

Now, this is a freeze frame. We have no intention to deceive anybody. However, the speed is now picking up again, you can see the heart again beating, and from time to time you can see the lower extremities here, the hand approaching the mouth here. The mouth is roughly here.

As I say, the eye is over here. So we are seeing the child in profile here. From time to time we will see the child turn, so he will be facing our direction. I will point that out.

Now, this child is moving very quietly, as you can see. The abortion is about to commence, and in a moment we will see it begin. The child is now facing you. Now it is back in profile again. Now, this is just a freeze frame again, these freeze frames were made simply to study the reactions and the anatomy more closely. You can see the spinal column at the back.

Senator **HATCH**. Point out the spinal cord to us again.

Dr. **NATHANSON**. The spinal cord is right here. The ribs are silhouetted up here. This is the spinal cord in the back.

Senator **HATCH**. It seems to be turned away from us.

Dr. **NATHANSON**. Now it is back to looking at us. Now it is facing us again here, and now it is still facing us. You can see the centrix also of the brain here. Now it is in profile again. This cyclone like shadow, this white cyclone like shadow, that you will see from time to time is the abortion instrument coming into the uterus, invading the uterus.

Senator **HATCH**. Is he using a suction apparatus?

Dr. **NATHANSON**. It is a suction apparatus. There it is again. It is reaching for the child, but the amniotic membrane is still intact, so it can have no contact with the child until much later in this abortion. The child, however, moves in a very agitated seemingly purposeful manner. One can see the child twisting and turning from side to side. It is now facing you. Now it is facing us again. And in a moment it will come back in profile. Now it is in profile again.

When you can see the two large reservoirs of fluid in the head, those are the cerebral ventricles, the lateral ventricles of the brain. Now the child is moving. Here again the instrument is seeking the child, and we will watch this unequal struggle for a number of minutes.

Now, this is in slow motion, just so there is no misunderstanding here, no attempt to deceive. These are slow motions, again, used for purposes of further clarifying or understanding what is happening, and in a moment you will see the film revert to its normal speed. The film does not speed up unduly, past its normal speeds once the slow motion is finished. It is quite clear that this is slow motion. There have been some rather pedantic accusations that we have tampered with the film.

Here comes the abortion instrument again. You can see it moving slowly in the bottom of the screen.

Senator **Hatch**. Still in slow motion?

Dr. **Nathanson**. Yes. You will see it flash across the bottom, also across the bottom of the screen in a moment. Again, more slow motion here. These were done for academic purposes to study the technique here. The child is in profile, the head up here, the body down here, here is the lower extremity down here.

We are running again through the slow motion, again a lower extremity, a thigh here, the head here, the body down here. This is a long, lengthy segment of slow motion. Here is the spinal column again back here, this white area here.

Senator **Hatch**. How much time has elapsed and how much time does the entire process take, really?

Dr. **Nathanson**. The entire procedure took about 16 to 18 minutes. Obviously, this film will run a little longer, because of these lengthy slow motion segments.

Senator **Hatch**. Would this particular sonogram be the type that you would use to operate on fetuses or to inject material into them?

Dr. **Nathanson**. Yes. This is real time ultrasound images. Now, the abortion instrument, you can see it flashing back and forth, it is back to regular speed again. It is this cyclone-like thing that comes in and out of the picture. There it is again. Again, again here, again here. Here it is right here, frozen. This thing that looks like a cyclone.

Senator **Hatch**. Has it gotten through the placenta yet?

Dr. **Nathanson**. No. That is up here. The amniotic sac is intact. This black reservoir of fluid, which looks all black against the child, will disappear. We will no longer see that. There is the abortion instrument coming ever deeper into the uterus, seeking out the baby. And this child is undergoing a considerable amount of agitation, churning, movement, and in a few minutes we will see the amniotic sac ruptured and the fluid drained off, and then the actual tearing apart from the body from the limbs and the head. This is merely the stalking process here.

Here is a freeze frame with the child facing us again. Now, some more slow motion. You can see the instrument moving again slowly across the bottom of the screen, and now out of focus.

Senator **Hatch**. How large is that instrument, and what type of a head——

Dr. **Nathanson**. The instrument is about 11 millimeters in diameter, and it is approximately 9 inches long. I have mixed up my measurements there, but actually it is about, I would say, about 20 centimeters long, and about 1.1 or 1.2 centimeters in diameter.

Roughly a third of an inch, half an inch. There it is again down at the bottom of the screen during this slow motion segment.

Here we go again. You can see it moving at the bottom of the screen. It probes deeper and deeper in to the uterus, tinting the amniotic membrane, as I said, and attempting to break the membrane. The membrane is remarkably tough, and sometimes the abortionist can attempt this for quite a period of time before actually rupturing it.

The baby is now facing us. You can see the large black reservoirs right up here, this is the face right up here, and the body here. The hands and upper extremities are here. It is looking directly at us. It is turned 90 degrees to face us instead of being in profile. You can see the abortion instrument again at the bottom of the screen now.

Senator HATCH. This is still in slow motion?

Dr. NATHANSON. Yes. This is all in slow motion. Now the child is turned back into the profile view, and that is just a very, very slow motion, virtually a freeze frame here. There is a good deal of grimacing on the face of the child, and you can see it here, with what appears to be the open mouth directly over the chest. The child will turn in a moment to face us. Here is the child moving way up to the left extremity of the uterus as the abortion instrument seeks it out. It propels itself or it goes directly up into the one corner of the womb.

Again, the instrument is right deep into the uterus, virtually in contact with the child, except that is intervening is still the amniotic membrane, and there is the child moving very rapidly up into the left corner of the uterus, as the abortion instrument follows it up. You can see the head up on the left. The body was not in focus on these pictures.

Now, we are back to normal speed again, and there is the freeze frame, and the head, and we are back to slow motion again. The child keeps moving up. You can see it directly up to the left upper corner of the womb, moving away from the instrument.

There it goes again, sliding up to the corner, and we have more footage of this chase. Again the slow motion segment. These, as I say, are the raw, unedited tapes, anyway. We did not chop out anything except to slow it down from time to time.

Now the uterus begins to contract. You can see the curious shape and the membrane has now been ruptured, and you can see that the black reservoir against the child's background has now been lost. There is virtually no background of black material. The fluid is now drained out.

Now, here is the crux of the abortion, where the instrument now clamps itself onto the body of the child and begins to tear it apart. The detail here for those not familiar with ultrasound is not as good, since we don't have the membrane, or the amniotic film as a background to look, but we can see the instrument flashes across the screen from time to time. Here is the ribs. Here is the head. The ribs down here, and these ribs in a moment will be torn away. The whole body will be torn away from the head by the force of the suction here, leaving us with a disembodied head floating around in the uterus. Here is the head again here. Right up here, and the body has now been torn away. We no longer see the heart beating, the ribs. The entire body has been suctioned out, and what this formless material is is simply blood clots, and pieces of tissue, pieces of the body. The head remains floating right here, and the abortionist's job now is to get this 21 millimeter in diameter head through that instrument. Obviously, simple arithmetic tells you that a 21 millimeter sphere will not go through a 11 millimeter canulow, and what the abortionist must use, of course, is to use this instrument, called a Pollack forceps, find the head, clamps, called the midline echo, and these are the snapped-off portions of the column.

He must grab this head in this instrument, crush it, and take it out in pieces. That is the only way——

Senator HATCH. Is that what he is using right now?

Dr. NATHANSON. That is what he is doing right now, and I think the rest of the tape merely documents that procedure. I am not sure that it is necessary to view the rest of it.

Senator HATCH. That is fine.

Dr. NATHANSON. We are talking about the issue of pain here. I think that we are entitled, as reasonable persons, from the evidence in this film, the churning, the agitation, the speeding up of the heart rate, the grimacing, the attempts at flight, to infer that this child is in pain, although it may be in a primitive level. The concept of pain to the fetus is not new. This is a chapter from a textbook written by Robert Goodlin, who is professor of obstetrics and fetal medicine. This book is called "Care of the Fetus." It was published in 1980. This is no pro-life or anti-abortion pamphlet, but a standard obstetrical textbook, and chapter 16 devotes itself entirely to the subject of fetal pain. Goodlin's conclusions in this chapter reads in part, "But my basic concept that the fetus is a person and has a psyche, and that it often responds as in pain."

There are many other evidences of the pain. Clearly the pain receptors are present at this 12-week time, and I don't think we need dwell on that. But I would plead that the focus, at least on these video tape films, not be primarily on the issue of fetal pain, but rather, on the act which we have witnessed here today, and that is that we began this video tape with a whole, healthy, intact human being, unborn, and we end up with a person which has been torn apart, the limbs from the body, the body from the head, and the head floating around in the uterus, crushed and removed, and I do not believe that that act is compatible with the declared moral attitudes of any civilized society.

Thank you.

Senator HATCH. Thank you, Doctor.

How do you know that the fetal movement, then, in the sonogram that you showed to us, was not the movement of the camera, but the natural movements of the child?

Dr. NATHANSON. The camera can be—movements of the camera can be distinguished from the movements of the child by watching the movements of the placenta. If the camera were to be jiggled up and down you would see the placenta moving up and down. We do not see that. The placenta is stationary in the uterus while the fetus is moving around.

Senator HATCH. Can you describe to us the various ways in which abortions are performed, and the likely pain suffered from the respective methods? Assume for the moment that the abortion is taking place at a late point in fetal development, when there is no question about his or her ability to perceive pain, and describe for us how the various types of abortions would affect that particular unborn individual.

Dr. **NATHANSON**. Well, what we have seen, today, of course, is the first trimester suction abortion, and I don't feel any reasonable person can fail to infer from these reactions that this child feels some pain at a primitive level. But as time goes by in a pregnancy, there is no question that the higher centers are more carefully and fully developed. The response to pain becomes more and more selective and appropriate. We know this from doing amniocentisis, even at 14 weeks, where if we stick the child with the needle the child will jump away.

Abortions are being done up to 26, 28, even up to 30 weeks by what is called the D&E method, which is a euphemism for dismemberment and pulling apart of the child. We have no video tapes of that. We don't think it is necessary.

We believe, all of us, that there is no question, this child certainly in the second trimester, the victim of D&E would certainly feel pain, and on and on right up to term.

Senator **HATCH**. Now, some have criticized the nature of ultrasound evidence in examining fetal pain. They have emphasized that ultrasound technology magnifies the fetus and may not reliably depict the speed and nature of fetal movements.

Could you comment on these observations and generally on the reliability of ultrasound photography to study the fetal pain phenomenon?

Dr. **NATHANSON**. Ultrasound in general has become so sophisticated now that we are relying on it for the entire field of perinatology. I have here an article in the May issue of Contemporary Obstetrics and Gynecology, a standard journal in the field of perinatology. This is an article by Frank Manning, who is at the University of Manitoba. He talks, based only on ultrasound examination, of the state of the child with respect to sleep. He talks, specifically, about, and I am quoting now, for the most part, fetal activities tend to peak when maternal activities are at the lowest. He speaks of the fetus breathing more actively at the end of the day, when the mother is in her least active phase.

He talks at great length about the sleep state of the fetus, the dream state of the fetus, with respect to movements of the eyes. He has studied the eye movements of the fetus in the second and third trimester. I don't think I should have to belabor the point that ultrasound is extraordinarily discerning, that it is becoming more and more sophisticated as time goes on, and I believe the evidence is irrefutable that we have fetal pain in these procedures.

Senator **HATCH**. Doctor, what is the normal heart beat for a fetus of the age portrayed in this particular sonogram that we saw today, and how can you ascertain that the rate increased as the threatening instrument approached the fetus within the mother's womb, and if it was increased, to what do you attribute the increase in the heartbeat?

Dr. **NATHANSON**. Well, probably some of the increase is due to fetal movement and agitation. The normal heart beat here is probably in the range of 160 to 180, but we have counted his heart beat at the conclusion of this procedure, at least while the child was still intact, and it ranges up to 200. We believe this is probably a result of the violent movement and agitation of the child.

Senator HATCH. To what extent do lower forms of animal life—dogs, cats, and seals and the like—demonstrate reactions similar to those of the fetus in your sonogram? Is there a fair analogy between animal pain and fetal pain in that neither can communicate verbally, and we must infer the nature of the severity of the pain from the circumstantial evidence that we see?

Dr. NATHANSON. I think the key word as you have expressed it, is infer. We cannot directly communicate with animals, but we can only make reasonable inferences with reactions to pain.

It is interesting that we have numerous laws on the books regarding the slaughter and killing of animals, we have specific laws about the destruction of newborn cats and dogs in pounds; we have laws about the destruction of cattle for food purposes, but we do not have, and these laws, by the way, take into account that animals feel pain, but curiously, we seem to be so reluctant to admit that our own kind feel pain, even though they can't communicate.

Senator HATCH. What was the age of the fetus in this sonogram, if you can tell us, and how can you determine that?

Dr. NATHANSON. It is without question about 12 weeks. We have measured the head, and we have numerograms, and tables, in which we can compare measurements of the observed child with the table. The table shows we have actually 12 weeks here. This head measures approximately 21 millimeters.

Senator HATCH. I would like to read from a textbook called "Development of the Brain." It says here on page 225:

> In the human fetus the initial neuroally mediated reflex movements in the spinal cord appear by the end of the fifth week, while it requires three additional weeks to create the spinal reflex arc.

Based on this observation that the unborn child has developed spinal reflexes within 8 weeks, this observation in this textbook, is it reasonable to assume that pain may be perceived by the infant soon thereafter?

Dr. NATHANSON. Yes. It is reasonable to assume that. In fact, in my view, unquestionable. Now, I will concede that there is no intellectualization of the pain here. Were this child, for example, to survive somewhere all of this procedure, I don't believe he would sit down later on and write a book about it, but I do believe that all the necessary reflexes, the necessary sensory and motor, are present for the perception of the pain, and response to the pain.

Incidentally, there is a textbook called "Electroencephalography." I have an abstract of it here. These authors go into the question of brain waves, and they state quite unequivocally that there are identifiable brain waves at 3 months, so we know there is some cordical activity.

Senator HATCH. Let me read from this a little bit further. Still on page 225.

"By the third month the fetus is able to respond to a tactile stimulation in the area of nervus trigeminus," the nasal/oral region.

Now, "this sensitivity soon spreads from the trigeminal area to the entire body surface."

Now, is it reasonable to conclude from this evidence that by the 12th week of development, the unborn child is capable of perceiving pain throughout its body?

Dr. NATHANSON. Absolutely.

Senator HATCH. You think it is?

Dr. NATHANSON. I think there is no question about it.

Senator HATCH. Let me turn to Senator Simon.

Senator SIMON. Thank you, Mr. Chairman.

I don't think there is any question that abortion is a tragic option. We don't want to encourage it. At the same time, we face, ultimately, the question not about whether there is pain, but how do you practically discourage it. Let me just read from this morning's paper: Sherry Metilus from Peoria, IL. You may have seen the Planned Parenthood full page ad this morning.

Dr. NATHANSON. I am afraid I didn't.

Senator SIMON. Let me just read her statement:

> I have been married for 35 years. I am the mother of five children, grandmother of three. In the mid-1950's, I was brutally raped and left for dead. I later discovered I was pregnant. I was horrified. I would not have that child. Our family doctor couldn't help. An abortion could have cost him and me 20 years in prison. I tried home remedies, like scalding myself and falling down stairs, but they didn't work.
>
> Finally, I found a local abortionist. I will always remember walking up those dark stairs, the incredible filth. The man had a whiskey glass in one hand, a knife in the other. Hemorrhaging and hospitalization followed. I thought I would never be with my family again. I had no choice but I resent what I had to go through to terminate that pregnancy. I resent the people who now say that women should have to undergo such experiences.

We have two questions. No. 1, do we want to declare by statute that that woman is a criminal?

Dr. NATHANSON. Well, Mr. Simon, everyone, I think, concedes that an unplanned pregnancy is a severe, wrenching social problem, but we are not advocating, nor do we practice the solution of sociological problems by surgical means. We could practically wipe out crime in this country by using lobotomy, but we do not do that. We do not castrate rapists, although we could reduce the rape rate by that way. This requires humane means of correction, not surgical holocausts as you saw on this video tape.

In the problem of illegal abortion, of women being mutilated and dying, I would refer you to this May issue of Obstretics and Gynecology. Now, this journal is published by the American Association of Obstetricians and Gynecologists, and in this journal, there are figures from the Center for Disease Control in Atlanta, studying in infant mortality, from 1978 up until very recently.

The conclusion of the article, and this is a very careful study, that abortion is now the sixth most common cause of maternal mortality in the United States, now in this era of so-called clean, safe, legal abortion. Women are still dying. It is more common than cerebral vascular accidents. It is more common than anesthesia accidents. It is almost as common as death from infection, and the Center for Disease Control states, or concedes, in this article, that these deaths they are reporting are at least 50 percent under-reported. There are at least 50 percent more they don't know about.

So my question is, How is it that in this era of legal abortion, pregnant women going for abortion are still dying in large numbers?

Now the only difference is, instead of dying in back alleys, they are dying in nice, clean, profitmaking abortion clinics.

Senator SIMON. I don't question any of your statistics. I frankly don't have the background and information there, but you have not answered my question. It is a question that other lawmakers and I have to face.

Should I declare this woman a criminal?

Dr. NATHANSON. No. The woman is not a criminal, Mr. Simon. It is the doctor, or the person who does the abortion that's the criminal. The woman is an unwitting victim, just as the child is, and women are victims because they have not been shown what abortion is. They have not seen such video tapes. When they have seen them, then they understand. There is a classic study done by Fletcher and Evans here at the National Institues of Health, I have a copy of it here, published in the New England Journal approximately 3 years ago, in which women at an abortion clinic were first asked to look at their child on the ultrasound screen. This was between 9 and 12 weeks, and of those women who applied for abortion, but first had to see the child on the screen, they all turned away and left without the abortion.

The investigators, Fletcher and Evans, concluded there was bonding as a result of this view of the child. This leads me in a circumferential way to advise you that if women were told what abortion is, and shown what abortion is, I believe they would, in the light of these facts, and these data, reject that option in overwhelming numbers.

Senator SIMON. So if I understand your answer, you are saying we should, by statute, declare the doctors criminals but not the women?

Dr. NATHANSON. That's correct.

Senator SIMON. I have to say that this is a question that troubles me. I have never hesitated to take unpopular stands, but as I listen to the arguments, both sides are right and both sides are wrong, and I have great sympathy for Cardinal Bernadine when he asked if somehow we can't get the two sides together to see if there are positive things that we can do.

My impression is that when we fight over a human rights amendment that is unlikely to be ever adopted, that we are not really doing anything very constructive.

Have you reflected at all, for example, on the possibility of assistance to teenage girls who are carrying babies to birth? Should we be assisting these women? Are there positive things that people, no matter what their background, could agree upon that would discourage the more tragic option of abortion?

The whole question of sex education clearly discourages abortion, and yet I find many of the people who oppose abortion also oppose sex education.

Have you thought about what we can do, beyond making speeches, to do something in a constructive way to discourage this tragedy?

Dr. NATHANSON. Yes, Senator, I have.

I think that the thrust of the pro-life movement now is at least as much on the question of support of women who have become pregnant through an unplanned pregnancy as it is against abortion.

I believe that Reverend Falwell, for example, has founded a huge number of support services and homes across the country. They now, as I understand it, outnumber the number of abortion clinics across the country. These are centers which are supporting women who become pregnant, taking them in, sheltering them, giving them medical care, hospitalization. They care for them afterward, train them in child caring. Even supply them with job training on occasion, and provide day care centers as well.

The whole birth right movement is doing a parallel service throughout the United States, and I believe that these are the movements, these are the resources which we should support. Not, as I say, these places where human life is being destroyed in mass scale.

Senator SIMON. Thank you.

Senator HATCH. I might mention with regard to your saying that the criminal in the matter is the doctor, that prior to *Roe* v. *Wade*, I believe all but four States forbade abortion under certain circumstances, and made it a misdemeanor against the doctor. In no case was the doctor sent to jail. It was a question of licensure.

Dr. NATHANSON. Yes.

Senator HATCH. And I might also add, in no case did it even involve licensure where the abortion arose as a result of a rape or incest. At least, I think those are correct statements about the law prior to *Roe* v. *Wade*. So, although you say it is a criminal act by the doctor, it is more of a licensure consideration than anything else.

Senator HUMPHREY. Would the chairman yield?

Senator HATCH. We are pleased to have Senator Humphrey with us today. He is not a member of the committee, but he has done a lot of work in this area. We are thankful he has taken time out to be with us.

Senator HUMPHREY. Thank you, Mr. Chairman, for letting me appear. If I may put a question to the chairman.

On this same subject, you are the expert on the law in the room, have women ever been prosecuted for having had an abortion, or has the prosecution always been against the abortionist?

Senator HATCH. The prosecution has been against the abortionist. This is another one of the myths that crops up, that abortion laws lead to calling women criminals. Nobody wants to do that. Dr. Nathanson has stated, as I think very aptly, that this a social problem, and there may be good humane ways of solving those problems. But, unfortunately, the Supreme Court has gone to the extreme of even invalidating statutes which required that women be given information before they consent to an abortion.

Senator HUMPHREY. That ad in the Washington Post, then, paid for by Planned Parenthood, where a woman said she had an abortion because she feared going to jail for 20 years, that is a red herring?

Senator HATCH. Yes, it is. When the human life federation amendment was debated in the Senate, we knew we couldn't win the debate. We got 50 votes, and there were 50 votes against the constitutional amendment. Nonetheless we doubled our numbers of those concerned about this issue. What that debate did, I think, was to knock a lot of these myths out of the books. Unfortunately those same myths are arising again. We have just heard the myth about women facing jail because of abortion.

The basic question involved was licensure of the physician who performed the abortion.

Senator SIMON. If I may ask the Chair, because I don't know the details of the law in the State of Utah, but in my home State, while you may be correct, the women were never prosecuted, it was a violation of the law on their part to have an abortion. They could be prosecuted and they feared prosecution, and my assumption is that was probably the law in most States. I don't know.

The reality is that they feared prosecution.

Senator HATCH. Well, I would be happy to wipe out any law that would make it a crime if a woman had an abortion, but on the other side of that question, doctors who perform an abortion, illegally or otherwise, except to save the life of the mother, ought to suffer licensure sanctions.

Now, if you will join me, on the one I will join you on the other. I will join you on the other, even if you don't join me.

Senator SIMON. This is the one where we are all stating our opinions. I have struggled with this issue. I have ultimately come to the conclusion that we must leave it up to the woman and her doctor to make some very, very tough decisions. But we can provide help to discourage this tragic option, and that is what we ought to be working toward. For example, Jerry Falwell and I disagree on a great many things. I commend him, however, for what he is doing in this area. I think there are positive things that can be done. We ought to be figuring out what these positive things are.

Senator HATCH. Doctor, would you care to comment?

Dr. NATHANSON. Senator, where human life is at stake, and it is in this procedure, we have got to be more affirmative. I think we have got to legislate this question.

Senator HATCH. Senator Grassley.

Senator GRASSLEY. Mr. Chairman, I want to ask unanimous consent to insert a statement in the record.

Senator HATCH. Without objection.

[The prepared statement of Senator Grassley follows:]

PREPARED STATEMENT OF HON. CHARLES GRASSLEY, A U.S. SENATOR FROM THE STATE OF IOWA

Thank you Mr. Chairman. I want to commend you on convening this hearing today on the question of whether the human fetus experiences pain during the performance of an abortion.

Mr. CHAIRMAN. I believe that the taking of innocent human life is the greatest moral wrong that we permit in our society. I believe that the human fetus is innocent human life, and because of that I am opposed to abortion.

I have long believed that the Supreme Court's decision in *Roe* v. *Wade* was a legislative rather than a judicial decision and a tragic one, as well as one that is not well grounded in American law. The *Roe* decision elevated the privacy rights of one individual to the total exclusion of another—the human fetus. It did so by ignoring traditional concepts about human life and its beginnings.

Modern technology now increasingly demonstrates that most of those traditional beliefs about life were well grounded in medical fact as well as moral belief. We now know, through the sonagram such as we will view today—that the fetus is a living human being capable of living outside the mother's womb at the same period of development which we permit its termination.

Mr. Chairman, I do not seek to impose my moral standards on others. But the basic function of government is to protect those individual human beings who are incapable of protecting themselves. No one fits that definition better than the innocent human fetus, and no one is more deserving of the law's protection. I look forward to today's hearing.

Senator HATCH. Senator Humphrey.

STATEMENT OF HON. GORDON J. HUMPHREY, A U.S. SENATOR FROM THE STATE OF NEW HAMPSHIRE

Senator HUMPHREY. Thank you, Mr. Chairman, for permitting me to participate. I will try to be as brief as I can.

First, with respect to the general issue, the broad issue of abortion, Dr. Nathanson, I jotted down a few phrases that you spoke awhile ago while you were showing the film. You said, "The baby is now facing us. There is a good deal of grimacing on the face of the child. This particular unborn human is aged 12 weeks."

Dr. NATHANSON. Yes.

Senator HUMPHREY. When you were on the other side of the issue, when you were one of the country's foremost advocates for overturning the abortion laws, did you refer to a man 10 weeks after conception as a baby or a child at that time?

Dr. NATHANSON. No, Senator. We fastidiously continued to refer to it as the product of conception. A nice, sterile, impersonal term.

Senator HUMPHREY. Why do you now use the terms baby, child, and human being, and even audaciously using the term person? Why have you changed this terminology?

Dr. NATHANSON. I think as a result of this technology, and others like it that you have seen here today. I think our knowledge of this human being has exploded in the past 13 years or so since I left the pro-abortion movement. We now, as Dr. Manning pointed out in that article I referred to earlier, in "Contemporary Obstetrics and Gynecology," have such intimate knowledge of this person that we study its sleep cycles, its dreams, its daily activities, and I just don't think any longer that anyone who has the slightest bit of knowledge in this field can refer to it as other than a child in a state of prenatality. Prenatality is a new concept, and it springs from this new knowledge we have. Two hundred or so years ago, as you recall, childhood wasn't understood as a separate phase of our lives. Children were regarded as very small adults, and they were sent out to the farms or mines at a very early age, and it took hundreds of years before we finally understood the children are different from us, that they are in a different phase of their lives, and they have special needs.

Now, with the aid of this technology we are beginning to understand that this is a phase of our lives called prenatality, that first 9 months, and it may in fact be the most important phase of the whole spectrum of our lives, that it is in those months that we become the people that we are, that we organize ourselves and we develop our personalities.

Senator HUMPHREY. You are saying a new level of understanding, a new level of awareness has arisen out of the advance of medical technology since 1973?

Dr. NATHANSON. Absolutely. The field of perinatology was not even known in 1972, but it is now one of the most dynamic and one of the most rapidly exploding fields in all of the medical community.

Senator HUMPHREY. And did you say or suggest in response to the first question that terms product of conception, and the like, were used by you and your colleagues to disguise the humanity of the child, and to advance the argument for abortion?

Dr. NATHANSON. Yes. It was depersonalizing the child. It was necessary if one had to continue, or was to continue to function on that level that you saw on that video tape. There is an enormous mechanism of denial operating for those doctors who continue to do abortions, and they resort to such depersonalizing terms, and debasing the language means in order to avoid facing the reality.

Senator HUMPHREY. Now, with regard to pain, will you outline for us the methods of abortion, and how they correlate to the stage of pregnancy, beginning from the earliest times to the latest?

Dr. NATHANSON. Yes. There are what we saw here is the suction abortion, which is done up to approximately 12 weeks. From there until 28, 30, or 32 weeks, and there really is no end to it, what is called D&E, or dialytation and evacuation has become the major means of abortion. This is simply the pulling apart, dismemberment, disarticulation of the child. Other methods, such as saline, and the like, have fallen into some disuse, and the D&E method has become the method of choice, mainly, because it takes the abortion out of hospitals.

The D&E can now be done in clinics, so in a sense it is concealed from public view. It can be done up to any time, and there are virtually no witnesses to it as there are in hospitals, and, of course, it is far more remunerative for doctors than the saline solution types.

Senator HUMPHREY. Putting those aside for the moment, the D&E, which is the procedure of choice, I take it.

Dr. NATHANSON. Yes.

Senator HUMPHREY. And is surgical dismemberment of the unborn child, and removal from the uterus?

Dr. NATHANSON. That is correct.

Senator HUMPHREY. Now, getting directly to the question of pain, there is some controversy, I take it, about at what point pain in the sense that we know it can be sensed by the unborn child, but is there any controversy, for instance, that it exists after the 15th week?

Dr. NATHANSON. No controversy on that whatever.

Senator HUMPHREY. And how many abortions would you estimate, or percentage of the abortions performed are done from 15 weeks onward?

Dr. NATHANSON. Probably of all the abortions in the United States, I would estimate 5 percent or so are done, perhaps more, but around 5 percent.

Senator HUMPHREY. So if it is 1.5 million per year.

Dr. NATHANSON. That is 75,000 or so.

Senator HUMPHREY. 75,000 times a year human beings are chopped up—that's perhaps getting a little too graphic. Sliced up, dismembered. Is the woman in these circumstances ever told that her child can feel pain, just as she can?

Dr. NATHANSON. No. Every attempt that has been made to explore this with the woman in legislative terms, as you know, in informed consent has been defeated, and it is generally discouraged, and to the best of my knowledge, it is never even mentioned as part of an informed consent for an abortion.

Senator HATCH. But I might point out that the Supreme Court has forbidden the doctrine of informed consent as applied to abortion. A State may not require disclosure of precisely what this procedure entails, so even though the NIH study found that if pregnant women looked at sonograms, and could see their own fetus, that they would back away from abortions, States may not now have a law to do that.

Dr. NATHANSON. That's correct. That has been defeated on every occasion.

Senator HUMPHREY. Dr. Nathanson, supposing it was necessary to amputate the leg of a child within the first week after birth, for some medical reason, and supposing that procedure was carried out without anesthesia. What would the reaction be in the medical community?

Dr. NATHANSON. I think there would be a full-scale revolution on the part of the nursing staff, certainly, and probably on the medical staff of any hospital which proposed to carry out such a barbaric act.

Senator HUMPHREY. Supposing that happened 75,000 times a year?

Dr. NATHANSON. Senator, your guess is as good as mine. I think there would be such a massive public revulsion at such a proposal, that it would be quickly scrapped.

Senator HUMPHREY. Is there any medical difference between what I have just described and the real example of the 75,000 unborn children late in term whose whole bodies are cut up?

Dr. NATHANSON. No, there is no discernible difference whatever.

Senator HUMPHREY. Then at least with respect to that class of victims, there can be no doubt about the savagery and inhumanity of the procedure?

Dr. NATHANSON. Absolutely none. And I say that unqualifiedly.

Senator HUMPHREY. And then getting back to the matter of when you cross that divide, there is great question about the sensing of pain for hundreds of thousands of other human beings.

Dr. NATHANSON. As I say, I think even the most hardened abortion advocates will concede there is a primitive level of pain here.

Now, there is no cognition of it, perhaps, no sense of it in the cerebral cortex, and I don't think the child would intellectualize it, but certainly there is this primitive level of pain, and there is the avoidance of the source of pain.

Senator HUMPHREY. I am very nearly finished, but I want to be sure that no one confuses what the doctor said.

Dr. NATHANSON. I am referring to before 12 weeks.

Senator HUMPHREY. But for abortions performed beginning somewhere around 12, 13 weeks, surely at 15 weeks.

Dr. NATHANSON. Certainly.

Senator HUMPHREY. The child feels pain just as we do. The mother is never given the option of at least providing some means of numbing the pain for that child?

Dr. NATHANSON. Absolutely correct.

Senator HUMPHREY. I think the medical establishment in this country, within that segment I have just described, is guilty of the most unspeakable crimes, and has a great deal of housecleaning to do.

Senator HATCH. Well, Doctor, I want to thank you for appearing before us this morning. I would like you to stay, if you can, for the next panel, because we have some top authorities on both sides of this issue on the next panel, and let me introduce them.

We would like now to assemble our panel. We will ask that each of the remaining witnesses come to the table. The first of our distinguished panel to present a statement will be Dr. Kathryn Moseley. Dr. Moseley graduated cum laude from Harvard in 1974, and received her M.D. degree from the University of Michigan in 1978. She is currently a specialist in pediatrics and fetology, and is assistant professor at St. Louis University School of Medicine. She is also director of newborn services.

Dr. Moseley has also lectured on medical ethics, so we welcome you, Dr. Moseley, and we look forward to your medical insights.

We welcome each of you. Dr. Richard L. Berkowitz will be the next witness after Dr. Moseley. Dr. Berkowitz is a professor of obstetrics and reproductive services, and, if I am correct, associated with Dr. Nathanson early in his career. He currently serves as acting chairman, Department of Obstetrics and gynecology, Mount Sinai Medical Center.

The subcommittee is also pleased to welcome Dr. Daniel N. Robinson. Dr. Robinson, who will be the third witness, is professor of psychology, and past chairman of that department at Georgetown University. He is author of many books on neuropsychology and allied disciplines.

He is also president of the Division of History of Psychology of the American Psychological Association. So we are proud to welcome you to our subcommittee as well, Dr. Robinson.

Our final witness would be Dr. Mahoney. Dr. Mahoney is professor of human genetics, pediatrics, obstetrics and gynecology at Yale University School of Medicine in New Haven, CT.

The subcommittee is pleased to have one with your medical background to testify here today, Dr. Mahoney, and we appreciate the effort that you have put forth, and we want to thank all of you for coming, and adding your insights to this inquiry, which we consider to be a very important inquiry before our committee.

We welcome the testimony at this point of Dr. Kathryn Moseley, assistant professor of pediatrics from St. Louis, MO. Dr. Moseley, we are proud to listen to you.

STATEMENTS OF KATHRYN L. MOSELEY, M.D., ASSISTANT PROFESSOR OF PEDIATRICS, ST. LOUIS UNIVERSITY SCHOOL OF MEDICINE, ST. LOUIS, MO; RICHARD L. BERKOWITZ, M.D., PROFESSOR OF OBSTETRICS, GYNECOLOGY, AND REPRODUCTIVE SCIENCES, AND ACTING CHAIRMAN, DEPARTMENT OF OBSTETRICS AND GYNECOLOGY, MOUNT SINAI MEDICAL CENTER, NEW YORK, NY; DR. DANIEL N. ROBINSON, PROFESSOR OF PSYCHOLOGY, GEORGETOWN UNIVERSITY, WASHINGTON, DC; AND JEREMIAH MAHONEY, M.D., PROFESSOR, HUMAN GENETICS, PEDIATRICS, OBSTETRICS, AND GYNECOLOGY, YALE UNIVERSITY SCHOOL OF MEDICINE, NEW HAVEN, CT

Dr. MOSELEY. I would like to thank you, Mr. Chairman, and the rest of the subcommittee for inviting me here to speak today.

As you already introduced me, I am Dr. Kathryn Moseley, a graduate of Harvard University, and the University of Michigan Medical School. I am a board certified pediatrician and neonatologist, which is a specialist in diseases of the newborn.

I am also a fellow of the American Academy of Pediatrics. My current position is assistant professor of pediatric medicine at the St. Louis University Medical School.

I am also on the faculty of health care ethics at that same institution. I am in charge of the newborn services for the university service at St. Joseph Health Center in St. Charles, MO.

The subject of our discussion today is fetal pain, if it exists, and what the significance of it might be, and I would like to start with really the basics, the definition of pain. The American Heritage dictionary defines pain, and I quote, as an "unpleasant sensation arising from injury, disease, or an emotional disorder."

I believe that most people here would define pain in essentially the same way. What I would like to emphasize in this definition is that pain is subjective. No one can know of another's pain unless it is somehow communicated, either by language, or by some change in behavior.

We can assume that another is experiencing pain if we have some knowledge of the stimulus, such as watching someone burn their hand in scalding water. But we still can't know the intensity of that pain unless it is somehow communicated to us.

Medical science has still not found a way to accurately measure pain itself. The closest we can come to determining whether a patient is experiencing pain is monitoring the changes that occur in the body. Those changes, at their most basic, most primitive, consist of trying to get away from the painful stimulus, an increase in the heart rate, and in the rate of breathing.

In one sense, then, one might say that a fetus can feel no pain, because it cannot communicate that pain to us. It cannot speak to us about it. However, as Dr. Nathanson's ultrasounds have showed us, even at 12 weeks, the fetus can show us the physiologic responses that we have associated with the painful stimulus, avoidance, and the increase in heart rate. Nevertheless, many would argue that the fetal nervous system is not sufficiently developed to experience pain until much later in gestation, and that the physiologic changes that we just saw are due to something else, and not to the perception of pain.

In preparing for this presentation, my initial thought was to gather pages and pages of research and data in other disciplines.

I decided against that for a very simple reason. The subject of fetal pain is not the exclusive province of scientific research. Knowledge that pertains to the perception of fetal pain is standard lecture material in medical schools across the country, and so I have drawn all my data from medical textbooks currently in use.

Since this information is basically standard from text to text, I have cited only the two most commonly used textbooks, though other references can be supplied upon request.

To properly understand fetal pain, a brief review of the anatomy of the pain pathways, and the development of the fetal nervous system is in order. All of our senses, be they sight, hearing, smell, have two components, in the nervous system. The nerves that bring the information in from the outside, what we call the afferent fibers, and the nerves that carry our response to that information, the efferent fibers. Afferent fibers bring the information to the brain that allow us to answer the question what it is? The efferent fibers go to the muscles and carry what I call the body's response to that sensation, or answer the question what to do about it.

Without afferent fibers, there can be no perception of pain or other sensations. Without the functioning of the efferent fibers, even if something is perceived, there can be no obvious response to it. The perception of pain and touch has special nerves assigned to them in the nervous systems. These fibers are sent to the posterior half of the spinal cord, something called the dorsal horn, and lateral spinol thalamic tract. These nerves are vital to the perception of pain.

According to the standard embryology text used in medical schools throughout the country, both the afferent and efferent nerve fibers are present in the spinal cord about 2 weeks after the womb's first missed menstrual period.

Like the rest of the fetus, these fibers continue to grow and proliferate in both size and complexity throughout gestation, but it can be assumed that both groups of fibers begin to function in some manner from around 5 to 6 weeks of gestation.

So the fetus does have the nervous connections needed to perceive and react to pain very early in intrauterine life. As he or she grows and develops, obviously that perception and reaction is going to change in complexity and strength.

Another objection that has been raised in consideration of whether or not the fetus does experience pain is that of the lack of development of the cerebral cortex in the very young fetus and embryo. It has been commented that without a cortex, there is no experience of pain.

In answer to that, I would like to quote from a physiology text, the standard physiology text that is used in medical schools today, and I quote here:

> There is considerable evidence that sensory stimuli are perceived in the absence of the cerebral cortex, and this is especially true for pain. The cortical receiving areas are concerned with the discriminative, exact and meaningful interpretation of pain, but perception alone does not require the cortex. Stimuli which are painful generally initiate potent withdrawal responses.

What this means is that the fetus does not have the capacity to know what the painful stimulus is, but is aware of the pain, and will withdraw from it.

This pain perception is a function of the mid brain and thalamus. The thalamus develops early in gestation, and can be seen as early as 6 weeks. Because the brain is one of the most rapidly growing and differentiating organ systems of the body, major changes in form and complexity can be seen with even the smallest increases in gestational age, especially in the first trimester.

By the end of the seventh week of gestation, the end of what is medically known as the embryonic period, the beginnings of all essential structures and organ systems are present. The rest of the gestation, the fetal period, is devoted to the growth and elaboration of organ systems already in existence. Certainly those of us who care for sick, premature newborns, are aware of the fact that infants as young as 24 weeks gestational age respond to painful stimuli in much the same manner as term newborns. They attempt to withdraw, and if they are breathing on their own, attempt to cry.

While a sick infant will not respond as vigorously as a healthy one, we can all recognize an infant's response to pain. Even those babies who are on ventilators, and are therefore incapable of audible crying, will frequently open their mouths, and wrinkle their brows in a silent pantomine of crying. Indeed, they are crying, but we cannot hear them because of the tube between their vocal cords.

Considering what is known about the development of the nerve system and the pain pathways, it is logical to assume that fetuses of even earlier gestational ages experience pain as pain.

Now, obviously, because pain is subjective, it is impossible to prove that the fetus perceives pain and suffers. However, with our current knowledge of fetal anatomy and physiology it is overwhelmingly probable that the fetus does experience pain.

The burden of proof should be on those who assert otherwise.

Thank you.

[Prepared statement follows:]

PREPARED STATEMENT OF KATHRYN L. MOSELEY

Senator Hatch:

This is to address the issue of informed consent relative to women undergoing abortions. As with nearly every issue in medicine, the patient's pre-existing fund of knowledge varies directly with their education and socio-economic class. In the case of abortion, this is even more pronounced. Because of the rhetoric involved in the abortion debate and the use of misleading language, such as "products of conception", and "pregnancy tissue" instead of "fetus" or "unborn child", even the most intelligent, medically aware laywoman is operating at a marked disadvantage. Repeatedly, legislation has been struck down that was aimed at informing the woman about the true nature of her about-to-be-aborted child, and the nature of the procedure itself. So women are largely ignornant of what they are consenting to. This is even more the case for the economically disadvantaged woman.

Because of the nature of my specialty, I am usually aware of the status of all the women in the delivery area during my time "on-call". During my training (at a large inner-city hospital), it was not uncommon to have women admitted who were in their 5th or 6th month of pregnancy and in early labor. If the mother was poor and black, especially if the pregnancy was complicated by drug or alcohol abuse, the decision was usually made to induce or augment labor. Information was rarely given about alternatives. The use of labor-stopping drugs was given little mention, if at all. It was generally thought (whether true or not) that these women would not understand, were poor mothers in general and did not need or want another child.

For example, I was once called upon by the obstetricians who were unsuccessful in persuading a young black woman to have labor induced at 22 weeks gestation because her membranes had ruptured, though labor had not yet commenced. I explained to the woman the risks and benefits of the treatment options, something which the obstetric staff had failed to do. Immediate induction of labor would have meant certain death for the child, and expectant management would have meant an increased risk of infection for the mother, but also a small though real possibility of survival for the child. She chose expectant management.

While this is only anecdotal data, it points to a real shortcoming in our communication with these women and also is evidence of our two-tiered system of medical care. Those with intelligence and money receive the very best care and communication, and those without, do without.

Senator **Hatch**. Thank you, Doctor. We appreciate listening to you.

Our next witness will be Dr. Richard L. Berkowitz, professor of obstetrics and gynecology, and reproductive sciences.

We are happy to welcome you, Dr. Berkowitz. We will take your statement at this time.

STATEMENT OF DR. RICHARD L. BERKOWITZ

Dr. **Berkowitz**. Mr. Chairman and members of the subcommittee. I thank you for the privilege of addressing this subcommittee.

My name is Dr. Richard L. Berkowitz and I am a diplomate of both the American Board of Obstetrics and Gynecology and its subspecialty Division of Maternal-Fetal Medicine. From 1974 to 1982, I was a faculty member in the Department of Obstetrics and Gynecology at the Yale University School of Medicine, and from 1979 to 1982 was the director of the high risk obstetrical service at that institution.

Since 1982, I have been the director of the Division of Maternal-Fetal Medicine at the Mount Sinai Medical Center in New York City and am also professor and currently serving as acting chairman of the Department of Obstetrics, Gynecology and Reproductive Science of the Mount Sinai Medical School.

I am the coauthor of a book on the use of diagnostic ultrasound in obstetrical patients, an editor of the journal Prenatal Diagnosis, the author of approximately 60 scientific articles which have been published in peer review journals, and a member of the Central Program Committee of the American Institute of Ultrasound in Medicine.

I have never taken a public stand on the abortion controversy nor been involved in any organized activity with regard to that issue. For the past 10 years the thrust of my research has been directed toward the development of improved methods for diagnosing and treating disorders in utero.

Senator **Hatch**. Doctor, I don't mean to interrupt you, but weren't you affiliated with Dr. Nathanson in the early days when he ran the largest abortion clinic in the country?

Dr. **Berkowitz**. At that time, Senator, I performed abortions, but I was not a member of an organization that advocated the political aspects of extending abortion privileges.

Senator **Hatch**. But unlike Dr. Nathanson, you still believe that abortion is——

Dr. **Berkowitz**. Senator, I haven't said that. I would appreciate finishing the statement.

Senator **Hatch**. I just wanted to make sure, because——

Dr. **Berkowitz**. I have no public stand at this time on the abortion issue. I have never taken one, and I am not currently, nor have I ever been a political advocate concerning the abortion issue.

Senator **Hatch**. OK.

Dr. **Berkowitz**. My clinical activities have been devoted entirely to the care of referred patients with problem pregnancies. In summary, then, I am a clinician-scientist who considers himself to be a physician to the fetus.

Prior to coming before this subcommittee I have been asked to publicly comment on Dr. Bernard Nathanson's narrated interpretation of the ultrasound sequence shown in the film entitled "The Silent Scream."

I felt qualified to do this since in the course of my work I have personally performed several thousand hours of ultrasonic scanning in obstetrical patients, and have therefore had ample opportunity to observe both normal and abnormal fetuses throughout the period of their development in utero.

After viewing the film I found that I was in fundamental disagreement with Dr. Nathanson's analysis of the ultrasound images obtained during the abortion being performed. Rather than viewing a fetus recoiling in terror from the threat of impending dismemberment, I saw a fetus at 12 weeks of gestation responding to the physical prodding of a suction catheter with the same type of generalized body movements normally seen in unstimulated fetuses at this time in pregnancy.

In other words, I saw no evidence of a difference in activity patterns from those witnessed sporadically in fetuses whose "sanctuary in utero," to quote Dr. Nathanson, was completely undisturbed.

Life in utero is a continuum of development. The very early embryo is substantially different from an appropriately grown fetus prior to delivery at 40 weeks in terms of its form, size, and physiologic capabilities. Changes occur gradually throughout this extraordinary developmental voyage and not necessarily in parallel as regards different organ systems.

Despite Dr. Nathanson's comments to the contrary, life in utero is fundamentally very different from that outside the uterus. The fetus exists in a liquid environment and uses its umbilical circulation in lieu of kidneys and lungs. The anatomy and circulatory dynamics of the fetal heart are quite different from what they will be seconds after a neonate is born and takes its first breath. Prior to a gestational age of 7 to 8 weeks from last menstrual period the fetal heart is outside the chest cavity, and the intestines remain extruded from the abdomen until 10 to 11 weeks. The fetal palate isn't closed at 10 weeks and eyelids are still fused at 12 weeks.

Fetuses make bona fide breathing movements in utero. They expand their chest walls and move their diaphragms in a manner which is undistinguishable from that of neonates. Yet, they are not engaged in breathing as we understand it, because they are surrounded by fluid and are being oxygenated with umbilical venous blood. Similarly, they pass their hands over their scalps, but that doesn't necessarily mean that their heads itch, and they unfold and wriggle their fingers, but that certainly doesn't mean that they are hailing a taxicab. Fetal limb activity occurs throughout gestation. Women usually don't perceive this activity until 18 to 20 weeks but we see it routinely with ultrasound as soon as fetal limbs can be distinguished. The spontaneous limb movements routinely observed in the first and second trimesters are jerky, violent, and absolutely indistinguishable from those seen in "The Silent Scream." The fetus also opens and closes its mouth throughout this developmental process. We know that it swallows amniotic fluid, that lung fluid is expelled into the amniotic sac through an open mouth, and that the muscles of the jaw and face, like all the other fetal skeletal muscles, are exercised in utero. Therefore, the dogmatic conclusion that an open fetal mouth corresponds to a silent scream of terror, should, in my opinion, be regarded with considerable skepticism.

While the images displayed in "The Silent Scream" are open to a variety of fanciful interpretations, they do not constitute visual proof that the fetus was fearfully reacting to the threat of its imminent destruction, as claimed by Dr. Nathanson.

Does a fetus perceive pain in the first or second trimester of pregnancy? I can't be certain of this, but all my experience with fetuses to date leads me to believe that they don't. Webster defines pain as "an unpleasant or distressing sensation due to bodily injury or disorder." To my mind, the key word in that definition is "sensation." The observation that an isolated muscle strip contracts when stimulated demonstrates reaction, but certainly not sensation.

Since the mid 1970's, I have performed a number of different types of invasive procedures on fetuses in an attempt to diagnose or treat a variety of disorders. In all those years of biopsying skin, and introducing needles and shunts directly into portions of the fetal body during the second trimester, I have never observed a response which I construed to be a reaction to pain. I never, for example, saw a fetus whose skin had just been biopsied move away from the instrument which had performed that procedure when a second, third, or fourth sample was taken.

The fetal heart is always directly monitored with ultrasound when an invasive procedure is performed, and I have never observed a sustained increase in heart rate during a skin biopsy, an intrauterine transfusion, or any other surgical manipulation associated with the introduction of a needle into the fetal body.

Furthermore, in some cases where small pockets of amniotic fluid were shielded by intervening fetal limbs, I have intentionally tried to entice a fetus to move a limb by tapping it with the sharp tip of a needle in order to allow access to the sheltered fluid for aspiration. I have rarely found this technique to be successful. All of this suggests to me that while reaction to stimulation may be elicited in young fetuses, sometimes by merely making a loud noise in the room, they do not display purposeful activity and show no evidence that they perceive either pain or fear.

This subcommittee has been convened to address the question of fetal pain, but clearly the abortion issue itself and a variety of associated nonmedical questions raised by "The Silent Scream" are at the heart of these proceedings.

The CBS Morning News showed a statement submitted by Dr. Nathanson on his letterhead stating the following: "With respect to those who would carp at isolated technical aspects of 'The Silent Scream', I regret they have permitted their scientific objectivity to be obscured by political allegiances," and also, "Unhappily, like so many in the proabortion ranks, they remain bogged down in the fever swamps of 1960-ish sloganeering and ideology while the issue has leaped past them into the high-tech-state-of-the-art 1980's."

Dr. Nathanson is well known as a vocal antiabortion lobbyist and the concern he raises about scientific objectivity being obscured by political allegiance can certainly be redirected toward himself.

Furthermore, as one who is not politically aligned with proabortion groups, and as one of the individuals in this country who takes pride in his contributions to what Dr. Nathanson refers to as the "high-tech" 1980's, I strongly resent his misuse of a technology with which he has, to my knowledge, demonstrated absolutely no documented expertise. The abortion issue is one of the great dilemmas faced by our society, and I personally respect the views of people on either side of this question.

I implore you, however, not to try to settle this issue with pseudo-scientific claims that an early developing fetus is indistinguishable from a newborn baby.

Thank you.

Senator HATCH. Thank you.

Our next witness is Dr. Robinson, and maybe you can help us develop this issue on a non pseudo-scientific basis.

Dr. ROBINSON. I am also not a member of the Book of the Month Club, or any of these other organizations.

Senator HATCH. Dr. Robinson is one of the world's leading authorities on the structure and the function of the brain. He has authored many books on medical subjects relative to the brain and sensory capabilities.

We are happy to have you here as well, and we will be very interested in your comments and, Dr. Nathanson, we will give you a chance to respond at the end.

STATEMENT OF DR. DANIEL N. ROBINSON

Dr. ROBINSON. I wish to begin my very brief remarks by saying that I am honored to be asked to serve this committee in its important and even historic mission. I can only hope that my own small contribution will help to clarify the vexed issues now under consideration.

The question of when or whether the human fetus is capable of experiencing pain has received very wide attention as a result of Dr. Nathanson's film "The Silent Scream," which provides an ultrasonographic record of the abortion of a 12-week fetus. The film and the accompanying narration are intended to alert the audience to the possibility of a grave wrong being perpetrated, and thus to encourage us to reconsider the legal protections how extended to those who would use abortion in instances of unwanted pregnancy.

These protections now cover more than a million such abortions annually and have come to be regarded in many quarters as a settled policy answerable to nothing less than a woman's basic rights.

Whether or not women should have or, in some philosophical sense, do have this right depends, of course, on the status that is assigned to the fetus, for it is this consideration that finally permits us to distinguish between abortion as a species of elective surgery and abortion as a species of homicide.

Dr. Nathanson's recent contribution to the debate has been criticized on several grounds but I shall consider only one; namely, that our current scientific knowledge does not sutain Dr. Nathanson's claims regarding fetal pain and distress.

This criticism rests on the following two propositions:

First, that, at 12 weeks, the human fetus is so lacking in cortical development as to be incapable of integrated experiences of any kind; and,

Second, that the behavior displayed by the fetus in the film, is entirely "reflexive" and is mediated at a merely spinal level of neural organization.

Both of these propositions are at once scientifically naive, conceptually defective, and theoretically groundless.

I begin by noting that what might be called "the anatomy of apin" throughout the animal kingdom, and including our own species, does not seem to avail itself of any specific region of the cerebral cortex.

What we know from the classical anatomical studies is that the specific pathways carrying "pain" information terminate in the thalamus which is the major sensory relay station in the brain and which is located below the cerebral cortex. Indeed, none of the regions now known to be implicated in the initiation and propagation of pain signals includes the cerebral cortex. All are subcortical, the chief ones being the thalamus and the periquaductal gray.

I should note that the 12-week human fetus has a well elaborated thalamus and periaquaductal gray as well as the peripheral anatomy needed for pain sensations arising from the surface of the body.

Pain is surely among the most primitive of sensations found in the animal kingdom for it signals the most immediate threats to survival. If only for this reason, we would expect it to be prevalent even early in the evolutionary series where cerebral development is nonexistent.

It is worth noting that the most developed regions of the brain lower in the animal kingdom are those associated with emotional and procreative behaviors; with fighting, fleeing and sexual activity.

These same regions are intimately associated anatomically with the sensory systems for smell, for taste and for pain. At least in general outline, the fetally developing human nervous system reflects these phylogenetic facts and provides at least presumptive evidence for pain sensitivity.

In this connection it is useful to recall that all behavior in response to intense pain is at least initially reflexive. When our hand falls on a red-hot object we do not engage in syllogistic modes of deliberation in search of an appropriate response.

Nature has fitted us with a more immediate solution; a totally reflexive solution for which the cerebral cortex may be utterly unnecessary. Thus, to criticize Dr. Nathanson for his reliace on reflex behavior is to fail to understand the neurobehavioral mechanisms engaged by painful stimuli.

To state the case briefly, from the fact or the alleged fact that fetuses can only respond reflexively, it surely does not follow that fetuses cannot experience pain. But let me state the case in yet another way.

If any competent scientist were to submit an application for research support to study pain in a nonverbal organism—a cat or dog or, ethics aside, an infant—the signs that scientist would specify as indicating pain would be just those displayed by the fetus in "The

Silent Scream." The scientist would certainly include measures of heart rate, reflex withdrawal of the whole body or parts of it, vocalizations, facial contortions and the like.

With uncustomary regard for philosophical nuances, Dr. Nathanson's critics have insisted that we cannot be sure the fetus is in pain merely by noting such behaviors. Alas, this is true, for we can never be certain that any creature—including any fellow human creature—is having any experience at all, including the experience of pain.

Whether a friend says to us, "I see the same sky that you do," or comes running in holding his cheek and shouting, "I have a toothache," we cannot be certain of just what his experience is. We can only infer this, and we do so on the basis of his behavior, including his verbal behavior. Where there is no verbal behavior we can rely only on nonverbal behavior such as that found in "The Silent Scream."

I am not prepared to say that that fetus was in pain; only that it emitted the sorts of behavior characteristic of animals in distress. What I am prepared to say is that our position on this question cannot be determined by the cortical anatomy of the fetus.

Dr. John Lorber in England has shown how entirely normal the psychological development of human beings can be even when cortical improverishment post-natally is extensive.

May I call your attention to the fact that studies of prenatal human behavior—and here I refer to studies of a systematic nature—appear in the scientific literature in abundance as early as the 1920's and 1930's. Developmental psychologists and neurologists, eager to race the functional anatomy of human beings back to its earliest stages, availed themselves of fetuses removed for one or another medical reason at various stages of gestation. Pioneering studies were conducted by M. Minkowski in Switzerland in the early 1920's, by M. Bolaffio and G. Artom in Italy at about the same time and by W.F. Windle and collaborators here a little later.

I should mention the celebrated if unsettling study by Bolaffio and Artom in which the 11-week fetus was surgically deprived of its cerebrum whereupon its spinal reflexes were found to be more pronounced.

Setting the ethics of the case aside, we discover in this finding strong presumptive evidence that, by 11 weeks, the inhibitory functions of the cerebrum seem to be present in at least rudimentary form.

Much of this older literature arose from research that was unavoidably gross and general and often contaminated by obstetrical practices that are no longer used. Typically the fetuses were obtained by caesarian section and were narcotized by the general anesthetic administered to the mother.

In other cases, the fetuses were separated from their sources of oxygen and nourishment, immersed in physiological saline solutions kept at "blood temperature" and studied quickly as anoxia led inexorably to death.

I mention this chiefly to underscore the sorry state of the fetuses on which the relevant literature is based and to alert you, therefore, to what is probably an underestimation of prenatal psychological capacities.

Thirty years ago, after reviewing most of the research that had been completed in the preceding decades, Norman Munn would write in his authoritative text:

> Around the eighth week, responses to tactile stimulation of the face may be elicited. These responses tend to be of a rather gross nature, involving the head, trunk, and extremities. So-called spontaneous movements are present during the middle of the third month, and are similar in nature to those aroused by light tactile stimulation in the region of the nose and upper lip. Reflexes of a rather precise nature are clearly apparent during the fourth month. (The Evolution and Growth of Human Behavior, 1955: Cambridge, Massachusetts, Riverside Press; pages 188–189)

Neither I nor anyone else can declare that the 12-week fetus feels pain. It is not enough to point to the necessary anatomy being in place because matters of this sort are not disposed of by the mere facts of anatomy. The fetus at 3 months has taste buds but there is probably not enough environmental variety to stimulate these differentially. Indeed, the rods and cones of the retina also begin to appear at 3 months but the intrauterine environment is one of undisturbed darkness.

That the cortex is incompletely equipped at this early time is quite beside the point at issue since the cortex is not known to be an essential aspect of the "anatomy of pain." Clinical neurology turns up cases of persons congenitally insensitive to painful stimuli but with entirely normal cerebral functioning. See, for example, pages 550–551 in "Behavioral Neuroscience" by C.W. Cotman and J.L. McGaugh. Academic Press, New York, 1980; and, as in the case of Dr. Lorber's patients, cases in which cortical mass is dramatically lacking but where pain sensitivity is entirely normal.

The issue of abortion cannot be reduced to questions about fetal pain, nor can the moral gravamen of the so-called pro-life argument be lightened by the adoption of painless methods of abortion. Nonetheless, the public debate has seen fit to include considerations of this sort.

Even if they are, as I believe they are, largely irrelevant to the moral dimensions of the issue, their factual content still should be as accurate and informing as possible.

It was not too many years ago when we found advocates of what is called pro-choice insisting that human fetuses were little more than tumorous appendages.

In the wake of "The Silent Scream" we have now been treated to nearly as reckless an assortment of useless twaddle, much of it coming from medical and even scientific precincts. No brief statement can put the record entirely straight, but I hope here to provide the subcommittee with at least a few facts and cautions that might immunize the subcommittee against the more virulent strains of half-truth and innuendo.

All in all, the evidence is beyond dispute: One cannot specify the variety or quality of psychological functions solely in terms of cortical anatomy and physiology, and any attempt to do so arises out of scientific naivete.

Finally, Senators, I wish to raise the question: What difference would it make? If the human fetus is regarded as a human being deserving of our solicitude, then we surely would oppose its death even if pain were not involved. After all, what is wrongful in abortion is the taking of human life and this remains wrongful even if painless methods were developed and adopted.

Note, then, that "The Silent Scream" does not add something new to the issue. The issue is the same: What sort of beings qualify for the protections of law? Given that the being in question is human which is to say that its genetic makeup is drawn from that pool of genes comprising homosapiens—what else must it possess to find sanctuary in our Constitution? How tall must it be? How smart must it be? How much pain must it take?

I shall now attempt to answer your questions, and I thank you for your attention.

Senator HATCH. Thank you, Dr. Robinson.

We will now turn to Dr. Jeremiah Mahoney, who is a professor of human genetics, pediatrics, obstetrics and gynecology at the Yale University School of Medicine at New Haven.

Welcome, Doctor.

STATEMENT OF DR. JEREMIAH MAHONEY

Dr. MAHONEY. Thank you, Senator Hatch.

Mr. Chairman, and members of the committee, thank you for this opportunity to testify before you concerning the subject of pain in the human fetus.

I am a professor of human genetics, pediatrics, obstetrics and gynecology at the Yale University School of Medicine. My education in medicine began at the University of Pittsburgh, continued at the Johns Hopkins University and Hospital, where I became fully trained as a pediatrician, and was completed at Yale University with research training in human genetics.

I am a diplomate of the American Board of Pediatrics, and the American Board of Medical Genetics. I teach medical ethics at Yale University, and serve on the ethics committees within that institution.

I have been elected to membership in several professional societies, including the American Pediatrics Society, the American Society of Human Genetics, and the Society for Inherited Metabolic Disorders. I have served the last two societies as a member of their boards of directors. In 1974 and 1975, I headed a group of consultants which undertook and completed an extensive review of the scientific literature about the human fetus. That study formed the basis for an investigation and report by the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research to the Secretary of Health, Education and Welfare, and thence the Congress, about the nature, extent, and purposes of research on the human fetus. The National Commission had been created by Congress. Its work led to the current Federal regulations that protect the human fetus as a research subject, and simultaneously provide guidelines and opportunities to advance medical knowledge on behalf of the fetal patient.

I am currently a member of the Working Group on Human Gene Therapy of the Recombinant DNA Advisory Committee of the National Institutes of Health. This group has drawn up guidelines to assist investigators who wish to initiate gene therapy trials for several devastating genetic disorders, and will hear proposals from these investigators.

For over 20 years, I have been privileged to care for diseased children and small babies, even at times one of my own six children, and also to pursue research that would aid understanding of diseases in childhood and accomplish ways to alleviate pain and suffering of young people. For the last 15 of those years I have concentrated my efforts on the unborn human baby in a new area of medicine, whereby we are learning to diagnose and treat disease during fetal life.

This hearing ask questions about fetal pain. Does the human fetus, early in its development within the womb, experience pain? Can the human fetus be aware of pain? Can the human fetus be in fear of pain? I believe that all scientifically derived evidence and observations available today which bring light to these questions say no. I base this conclusion on the following considerations.

Pain is a perceived, subjective phenomenon. It comes in degrees but it is difficult to quantitate. All of us in this room have experienced pain. Most of us have smashed a thumb or finger with a misaimed blow of a hammer or have had a headache or sore throat. Many of us know the psychologic pain of having lost a loved one. Few of us, probably no one in this room, knows the intense pain of torture, pain that sometimes leads to loss of consciousness as a way of relief.

Pain is a universal human experience at our ages, and it requires an awareness or consciousness, functions of that part of the brain known as the cerebral cortex. If the cortex is damaged, by trauma, by surgery, and does not function, the individual does not perceive or feel pain. Stimuli from our environment or from within ourselves are passed along nerves, often by way of the spinal cord and brain stem to the mid brain. Reflex movements of our muscles may be initiated from the mid brain, brain stem, or spinal cord.

For pain to be perceived, for it to exist in its general definition, nerve impluses must pass from mid brain to cerebral cortex, and then must be passed from nerve cell to nerve cell within the cortex. This appears to be impossible in the human fetus during most of its development. The cerebral cortex is immature, slow to develop part of our brain during fetal life. Prof. Pasko Rakic, professor of neuroscience, and chairman of the section of neuroanatomy at Yale University, whose present focus of research is the developing brain, reports that there are few, if any, connections between one nerve cell and another, within the cerebral cortex in the first half of fetal development. Months later, when the cortex is mature, there will be literally billions of connections. Without these connections within the cortex, it is difficult for me to imagine that a fetus could be aware of pain, could perceive pain, or could fear pain.

I suggested earlier that pain is subjective. Nonetheless, we do have criteria for implying the presence of pain when we observe the behavior of another person. Major among those criteria, if a person cannot talk, is body movements. We can apply that criterion to the unborn human baby. I have watched thousands of fetuses at 15 to 25 weeks gestation, on a real-time ultrasound screen, just as we saw this morning, when there was no manipulation within the womb or when an amniocentesis needle was entering, or had entered, the mother's abdomen. I have also watched dozens of operations known as chorionic villus samplings, in which a thin plastic tube called a catheter, entered the womb through the vagina and cervix, in order to remove a small sample of the developing placenta at 7 to 12 weeks' gestation. These fetuses, undergoing disease diagnosis, were mostly healthy, normal fetuses who have since been normal babies at birth. It is immediately apparent that fetuses move in the womb from as early a time as we can distinguish body parts. They open their mouths, they swallow, they show breathing movements. For many decades it has been observed that they also have reflex movements if touched. The nervous system pathways of those movements go through the spinal cord or brain stem, and may utilize the mid brain, but do not go through the cerebral cortex. I have never noted other than random movements during amniocentesis or chorionic villus sampling, even though both of these procedures introduce an instrument into the vicinity of the fetus.

I have also touched the fetus. This has occurred during close to 300 procedures using a fetoscope within the pregnant womb. The fetoscope is an instrument that enters the womb through the mother's abdomen, much as an amniocentesis needle does. This procedure is carried out to draw fetal blood from the umbilical cord, to introduce medicines into the fetal circulation, to take a small skin biopsy from the fetus, or to visualize the fetus. Through the fetoscope I have watched the fetus suck, open its mouth, and move its limbs. I have touched fetuses many times, and been able to observe their behaviors through the feto scope, as well as on the ultrasound screen. I have also taken small skin biopsies from fetuses in the middle state of pregnancy, with an instrument that is pressed against the skin, and pinches off a tiny piece of it. During none of these procedures, including the skin biopsies which would cause us to perceive and report pain, during none of those procedures have I observed movements, or other behaviors such as changes in heart rate or swallowing rate, which suggest that the fetus feels pain. There have been no behaviors to suggest purposeful or evasive movements nor any to suggest awareness of the intrusion into the womb. Again, these unborn babies were usually healthy and continued that way, within the womb, until live birth.

A third type of observation also seems relevant to the question of whether the fetus is able to perceive pain. In newborn intensive care nurseries, we are now able to save occasional babies who were born weighing a little less than 1 pound. When one cares for these very small, very immature babies, one usually notes no movement response at all. If there is movement, it is a very sluggish response to stimuli that ordinarily elicite responses which we interpret as pain from the more mature newborn.

Thus, I see no compelling scientific evidence from neuroanatomy, from others' experience, or from my own experience, to warrant the conclusion that the fetus experiences pain in early or mid gestation. I believe that contrary claims are fantasy, and imaginative story-telling. I have looked at my own small infants asleep and imagined that they were creating a poem, or formulating a theory, or falling in love in their dreams. This brings joy to me, but I know it is not science, I know there are no observable facts to support its reality. What about a fantasy that the fetus feels pain, or joy, or can dream dreams? Are those not harmless ideas? I believe quite the contrary for the scientist or the physician. We seek truth. We believe in predictability based on fact. We are making rapid and important advances in fetal medicine including the ability to administer treatments to the fetus inside the womb. To foist upon the consciousness of the American public, or the medical profession, that the fetus feels pain when, in fact it does not, will raise anxieties of prospective parents, and of hospital staffs, may well lead to unnecessary and unwanted medicines being given, and will slow our progress in developing therapies for these very same fetal patients.

Finally, the subcommittee might ask why this fantasy has been brought to this hearing room. Why do people without scientific support suggest that the fetus feels horrible pain? The agendas may be several. The major one is obvious to us all, but I believe that any debate on legal issues is ill-served by fantasy and half truth. Whether it be by court decision or legislation, the law of our land should stand on accepted facts, not on fantasy.

Thank you.

Senator HATCH. Thank you.

Dr. Nathanson, if you would care to make any comments, we will take your comments, and then we will have some questions for you.

Dr. NATHANSON. I would like to yield the floor to Dr. Robinson.

Dr. ROBINSON. I think it might help auditors to hear this as soon after Dr. Mahoney's comments as possible. The control of intractable pain has been a subject that has engaged the energies of clinical neurologists for a long period of time. It is one of the great, great problems of our age, exaggerated by the fact that in some cases, intractable pain cannot even be controlled by severing neural connections to the areas that are the source of the pain.

Pain is an extremely complex phenomenon. I simply point out to the committee this: No. 1, every imaginable procedure that could be performed on cortical tissue for the control of intractable pain has been performed. There is no cortical locus in adult human beings that will regulate pain in any way at all.

No. 2, there are instances of brain cancers in which an entire hemisphere has to be removed. Hemicortectomized human patients do not lose pain sensation. The thesis that there is some connection between cortical function and pain is simply naive. I don't know why that proposition is offered.

The entire literature of the clinical neurology of pain is opposed to it, and is based on a human population that can provide verbal reports to tell us precisely what has happened. We have reached the point where we can do something about intractable pain. What we can do is electrically or chemically stimulate subcortical regions directly, and that will eliminate pain sensations sometimes for several days, at least for several hours. The effective regions are thalamic areas, and the perioquaductal gray. The cortex is completely bypassed in this regard and in the fetus, the subcortex develops early. Now, I object to anyone appropriating the good name of science, and then declaring categorically that 12-week fetuses can't feel pain, while at the same time acknowledging that the entire experience is subjective, and one can't make this inference even regarding other human beings. We are in a gray zone here.

I always thought the abiding maxim in medicine was, When in doubt, do no harm; primum non nocere. That is the Latin rendition of the Hippocratic oath. If you go into a room, and there is movement behind the curtain, and the room is dark, and you are not sure what entity is behind the curtain, you don't go bang, bang, bang, and see what kind of body falls out. First you establish what kind of entity it is, and if there is a suggestion at all that that entity might be sufficiently kindred to your own kind, both the law and the full weight of morality oblige you to do no harm.

Senator **HATCH**. Dr. Nathanson.

Dr. **NATHANSON**. Thank you, Dr. Robinson.

Mr. Chairman, I have been impressed by the transcendental eloquence of the distinguished witnesses, particularly the speculations of Dr. Robinson, which has dominated the discussions this morning. I was profoundly saddened to hear Dr. Berkowitz describe himself in his own words as a physician to the fetus.

I know of no other doctor in the branch of medicine who would stand by and watch 1½ million members of his patients torn apart, dismembered and destroyed without failing to resist such a massive assault on his patients.

It is endlessly curious to me that otherwise sensitive, good-hearted people, who are so quick to anthropomorphize the reactions of animals to painful stimuli, are so reluctant to do so for one of their own kind. If this were an animal on this screen being torn to pieces before our eyes, you can be sure the animal rights legion would be in this room, and would have shut this hearing down in no time at all.

There is one other kind of pain we should mention, and that is the visceral inchoate pain of the rest of us who watched this defenseless animal being torn apart in this act. We do not intellectualize pain. The severely mentally retarded or uncomprehending, they are unable to intellectualize anything, but what physician would dream of operating on such a person without anesthesia, or of withholding pain medication, if they are opposed to painful experiences?

In research we do not operate on animals without anesthesia. I have invited the abortion advocates to make their own video tapes of an abortion at 12 weeks, to show us what a beneficence it is for the human unborn. And you can be sure, Mr. Chairman, they have made dozens, if not hundreds, of such tapes, and have discarded them all as repulsive, and unfit for human consumption.

They know that they will not see the child sliding happily down the suction tubing waiving and smiling as it plunges in the bloody gauze trap. All we get from them is more 1960 can't, slogans, and bombast. After discarding all the political banalities, after picking one's way through all the scientific dickering and waffling, and after all, scientists are first people who build the Brooklyn Bridge, and then buy it. There are only four short questions of quintessential interests here.

One: Is this that we saw a real time ultrasound film?

Two: Is that a human unborn child on the screen?

Three: Is that a real time ultrasound record of the abortion of a human unborn child?

Four: At the conclusion of that film, has the life of that child been obliterated, the body torn from the head, the head crushed and removed in pieces?

Even our neutral experts will agree that the collective answers to those questions is yes, and then one final question is in order. Is the brutal act depicted in this film the deliberate, unappealable destruction of that tiny, defenseless human being, compatable with the declared moral certitudes of any civilized society?

Up until now, protected by a potent and omni present mechanism of denial, physicians have practiced abortions untroubled and unmolested, and now faced with this film, and others that will follow, and there will be another film to follow this, Mr. Chairman, they are suffering an acute crisis of the conscience. Hence, the frenzy and the fury from organized medicine over these films.

Thank you.

Senator HATCH. Thank you.

Let me ask, are all of you familiar with this textbook of "Medical Physiology" by Goodlin? [All witnesses affirmed.]

This is a standard textbook used in most medical schools.

Let me read from this, and ask each of you this question, and I will refer——

Dr. BERKOWITZ. Excuse me, Senator Hatch.

Will we have the opportunity to respond to anything that has been said?

Senator HATCH. You will. If you would prefer to do that now.

Dr. BERKOWITZ. I would like to make one comment.

Dr. Nathanson began the remarks he just made by saying he was profoundly saddened by my claim to being a physician to the fetus, because he knows of no other physician who would fail to take a stand against the indiscriminate murder of a million and a half of his patients.

I would like to point out that the professional organization for maternal-fetal specialists in the United States is the Society of Perinatal Obstetricians [SPO]. That is the organization for everyone in this country who has subspecialty boards in maternal-fetal medicine, i.e. those who are as Dr. Nathanson refers to them, fetologists. He refers to these physicians as experts, when that serves his purpose. Neither groups of individuals within the SPO or the organization itself has taken a stand against the abortion issue. Nor has the American College of Obstetricians and Gynecologists, which contains the obstetricians in this country, the overwhelming majority of whom, I believe, would consider themselves to be physicians to the fetus. I therefore, think that the allegation made by Dr. Nathanson that no caring, concerned physician to the fetus would stand by and allow this to occur without comment is unfair.

Senator HATCH. Let me ask you a question with regard to that.

Is it true that you served with him when he ran the largest abortion clinic in the country that, you worked with him in that clinic?

Dr. BERKOWITZ. You seem determined to pin down my personal feelings about abortion.

Senator HATCH. Well, I think it is important here. I think each witness has indicated their personal feelings. I personally feel that such disclosure is a crucial indicator. You have indicated that Dr. Nathanson is a leading advocate against abortion. I think that is a fair comment. He is. He has become, I think, the leading advocate in America, against abortion, after having been the head of the largest abortion clinic in this country. His background is very pertinent to his current beliefs and expertise.

I think it is equally pertinent to ask you questions like—and why don't you just answer them—did you serve with Dr. Nathanson in his abortion clinic when he was performing abortions? And if so, how many abortions have you performed during your medical career?

I would like to know that just for the record.

Dr. BERKOWITZ. Senator, I would be happy to answer those qusstions to you over a cup of coffee or over a drink, or——

Senator HATCH. Why not openly and honestly here?

Dr. BERKOWITZ. Because the reason I have been asked to come here is to comment on something about which I have expertise, which is my knowledge of fetal development, and in particular my knowledge of the ultrasound——

Senator HATCH. You see, Doctor, you have indicated that Dr. Nathanson's testimony might be valid because he is a leading advocate for a pro-life cause.

Now, I am suggesting that it is important to find out whether your advocacy is valid also because of what you personally advocate.

Did you work with him in an abortion clinic?

Dr. BERKOWITZ. May I ask you a question in return?

Senator HATCH. How many abortions did you perform?

Dr. BERKOWITZ. My question to you is this, if I told you I didn't do abortions, would that make me an antiabortion advocate, and will that make my testimony different?

I was called to come here to talk about my area of expertise, but I will answer your question.

Senator HATCH. I encourage you to answer these questions. You have accused him. All I am saying is maybe he can accuse you.

Dr. BERKOWITZ. Before I answer it, and I will answer it, Dr. Robinson made a comment, he quoted——

Dr. ROBINSON. Just the epitaph to Christopher Wren. He said, if you seek his monument, look around you. So whether you say you favor abortion or not, if in fact you actively performed these during your professional career, this is a sufficient statement; it is a nonverbal statement. I would regard you, Dr. Berkowitz, as someone incapable of doing anything that you judge to be morally wrong, and so if you do abortions one would judge that you do not find in that act a moral wrong.

I don't see what this waltz is about. If you don't regard abortion as morally wrong, why would you be diffident about reporting the number of times you have performed the service? And if on the other hand you consider there is something tainted about the practice, why would you continue to defend it?

Dr. BERKOWITZ. Because, Dr. Robinson, I think, that is one of the major problems with these controversies. I think that the overwhelming majority of the individuls in this room, walked in here with an opinion about abortion, and that these hearings will do absolutely nothing to change that opinion because it is fundamental. They have thought long and hard about it, or they have had gut reactions to it, but they have a stand.

I think this interrogations bears witness to that fact.

Senator **Hatch**. I think there are people in here who have not made a value judgment, and there are others who are very intensely interested on both sides of the question. I think one is Dr. Nathanson, who has performed 60,000 abortions. He became convinced from the study of fetology that abortion was a moral wrong.

Dr. **Berkowitz**. The intent of the subcommittee hearing, at least it was my understanding that the intent of this subcommittee was to discuss not the morality of abortion, but the issue of fetal pain, and that is why I was asked to come down here.

In answer to your question I do not do abortions anymore, with the very occasional exception of doing an abortion on a patient whose fetus has been diagnosed as having a terrible genetic abnormality.

I would say that in the last 6 or 7 years I have done less than five abortions. Now, that is not necessarily in any way a statement about my feelings about abortion, the morality of abortion, or the current status of abortion in this country.

That is something which I have chosen to do, and my reasons for doing it are not relevant to this subcommittee meeting.

Senator **Hatch**. That is a fair statement.

Dr. **Berkowitz**. Dr. Nathanson performed abortions and is unhappy that he did it.

My reasons for not doing abortions at this time may be identical to his but they could also be completely different. I came to this subcommittee to talk about something that I know about, which is what can be seen on ultrasound, and I think what you have been shown today has been distorted by someone who really has a political objective. If you would like to discuss the morality, the ethics, the horrible aspects of abortion, that is an absolutely legitimate subject for discussion, but I don't think that Dr. Mahoney and I are reasonable people to have sitting at this table for that sort of discussion.

Senator **Hatch**. That is fine.

Dr. **Mahoney**. Dr. Robinson raised issues with my testimony. I have no difference of opinion about the facts that he cited, the pain reflex in lower animals, and in human beings basically starts at the periphery of our body, although at times within our body in organs like our intestinal tract, and sends impulses through our spinal cord and brain stem system to our mid-brain, and elicits efferent responses. Yes, those responses are protective. They are very important, to any person or species.

The question about which there is not enough evidence to have a clear understanding at this time, is the perception of pain as it occurs in the cerebral cortex. He is correct. There isn't a single localized part of the cerebral cortex that mediates pain perception. It is diffuse. There are connections from one part of the cortex to another, from one side of the brain to the other side in most human beings. Those parts, those connections within the second and third layers of the cortex are where most neuroscientists believe that our perception of pain, our awareness of it lies. The evidence from neurosurgery and from neuroscience is not yet complete.

The evidence about the maturation of the human fetal brain in the first half of pregnancy is reasonably complete, although the specimens that have been examined were not thoroughly adequate. We do have some evidence from the monkey fetus insofar as that fetus has parallels to our own development. The migration of cells into the surface layers of the cortex is still going on late in pregnancy. Actually, in the middle third of the monkey pregnancy, only a few cells have reached those layers. They have not yet set up connections between cells. We do not know anything about the physiology, about the chemistry of those cells, and whether they are able to function, or do function at that stage, but the monkey is born with a more mature nervous system than the human being. If we can extrapolate, we would suggest that the human being's cortex is not as far developed at a similar stage in pregnancy.

The neurosurgeon or the neurologist's ability to control pain by maneuvers at the mid brain or thalamic level are certainly easy to understand. The pain reflex does go through those areas. There can be interruption of the continued passing of information from the thalamus up to the cortex, up to the cerebrum. In the clinical situations that Dr. Robinson talked about, the syndrones that show insensitivity to pain, we do not know as yet where the pathology lies in most instances. Sometimes pathology is in peripheral nerves, but if it would lie in the thalamus or mid brain, this would be a serious distortion of the central nervous system. Most people would suggest that that would imply much more serious consequences to the total human being. Yes, these people do have an organized cortex for most of the functions that we associate with the cortex. What they do not have is the ability to perceive pain, and they get harmed for it. We don't know where the pathology lies for many of them, in what part of the nervous system, the central nervous system or the peripheral nerves.

Dr. Lorber described newborn babies with severe hydrocephalus, swelling within the brain, which pushes and squeezes the cortex to the outside, against the skull. Those individuals, if they are properly treated, may have normal cortical function. The cortex, although squeezed, and although the nerves have to run through longer distances, is still there. When those people die and their cortexes are examined, the normal layers, and adequate numbers of cells for the functions that we ascribe to the cortex, including the perception of pain, are present.

So these individuals are not absent a cortex. They have had a squeezed cortex.

Senator HATCH. Dr. Robinson.

Dr. ROBINSON. Yes. I shall be brief. I am very happy that my distinguished colleague on the panel has retreated from the claim that the 12-week fetus can't experience pain, and recognizes the great——

Senator HATCH. I don't think he retreated.

Dr. MAHONEY. I didn't recant.

Dr. ROBINSON. You were agreeing with me hip and thigh, sir. We don't have to wait for Lorber's people to die, because he had them sent to Copenhagen, where Dr. Lassen could scan them, and we know in some instances the diminution in cerebral mass is on the order of 80 percent. This is not just a small amount. We are talking about craniums with mush, not cortex. I insisted this be shown on the first program of the PBS Brain Series. It was wonderful to see the "brainless" young woman say, "I didn't know how brainless I was until I saw the scan."

Now, here pain sensitivity is as normal as yours or mine.

Second, hemicortectomized people, people having had half of the cerebral cortex removed—there is no cortex there at all, there is none—do not show the pain impoverishment expected if the cortex were an integral part of this sensation.

Finally, I think the only thing that can be said for the role of the cortex in pain comes from studies of patients with pre-frontal lobotomy, also suffering from intractable pain. It is one of the curiosities that show up in medicine. What is sometimes found is this: The lobotomized patient does not have a diminished perception of pain, but simply does not suffer from what he himself reports to be the same damned pain. Now, that the cerebral cortex is a wonderful thing to have if you are a human being, or a primate, I have no doubt. In fact, a student asked why I was coming today and I said, to address the general question of how far one can get in this world without a cortex. And what better place to raise that question than the center of government. [Laughter.]

Dr. ROBINSON. One can get some distance in this world without cortical elaboration. I don't know the intensity or quality of pain available to human organisms and the higher primates early in gestation, when there really is an insufficiency of cortical elaboration. I don't know.

What Dr. Nathanson's film, and the literature of the 1920's and 1930's indicate, is that there may be at some primitive level some experience of pain.

It is a technical subject to be addressed technically, but technical subjects also require some degree of interpretation. This is what science is based on. Not mere facts, but interpretations of facts.

I would say at this stage of the game, the odds on 12-week fetal pain are 50–50; flip a coin. One can't decide for sure. It is very difficult. First of all, that fetus is in a viscous medium. Let me give you an instance. The 12-week fetus, if the eye is tapped, squints. Two or three weeks earlier, there would be a total body response to that. Here we have a much more localized response.

Do you want to argue that the more localized the response, the more organized the neural circuits serving it.

I can give you many pieces of evidence to show you that that is not valid in all cases.

So I say interpreting the neuropsychological facts, the anatomy, behavior, and the like, is to some extent a magician's labor, but no responsible science—one who has contributed to the literature of the neural sciences, and particularly that literature relating neural function to perception—would take an unequivocal position on the capacity of a 12-week human fetus to experience pain.

The most one can say is that we don't know, and to that I would add, when in doubt, do no harm.

Senator HATCH. Dr. Moseley, do you have any comments?

Dr. MOSELEY. I do. I have many. I am not an ultrasonographer, I am not a fetologist, and I can't make comments as to the personal experience of Dr. Berkowitz, or Dr. Mahoney with reference to their experiences in stimulating intrauterine fetuses.

However, I would like to take strong exception to what Dr. Mahoney said about the 24 to 26 week now ex utero fetus, who is a resident of our neonatal intensive care units. I do admit that the survivors at 24 to 26 weeks of gestation, are few and far between. Under 26 weeks gestation, the mortality soars to 95 percent. However, of the 5 percent that do survive, there are a few, and again, they are rare, who require very little in the way of our intervention. Perhaps only an IV, things like that.

I have seen infants documented at 24 to 26 weeks gestation, not needing mechanical ventilation until several days down the pike. Those infants do respond very vigorously to pain, and if anyone would doubt that; as a matter of fact, I would challenge Dr. Mahoney to start an IV on a 25-week-old infant without restraining that limb first.

One of the signs we look at, be that child 24 weeks or 26 weeks of gestation, is how active they are when presented with a painful stimuli.

We are very concerned when a child does not respond to a needle stick, because that gives us one more indication of how desperately ill that child is and how much he needs our intervention.

Senator HATCH. Let me ask this question I wanted to ask from a medical text. You all indicated that this text is taught by the medical schools. I will just read from the text "Medical Physiology" under the heading "Functioning of the Thalamus and Cerebral Cortex."

He says here: "Complete removal after the cerebral cortex does not destroy one's ability to perceive pain."

Dr. ROBINSON. What Dr. Mahoney was actually referring to at this level was somatosensory sensitivity. Pain is this curious thing. It doesn't behave the way somatosensory sensations do.

Senator HATCH. "Complete removal of the cortex at the symatics does not destroy one's ability to perceive pain."

Do you agree with that, Dr. Nathanson?

Dr. ROBINSON. This is like agreeing to Newton's law. It is a fact of science.

Senator HATCH. I understand, that apparently Dr. Mahoney doesn't agree.

Dr. MAHONEY. Dr. Mahoney agrees that without a sensory cortex there still are perceptions. Without an entire cortex there seem to be no perception of pain.

Dr. ROBINSON. You see a decorticate animal lacks the response mechanisms even to report experiences if they are there. This is what is very, very tricky. You render an advanced species decorticate, you get—one shouldn't even hazard a guess what the sensor system——

Senator HATCH. This makes your case. If the thalamus is developed by the 8 weeks, and it is largely responsible for pain, is it reasonable to assume that this evidence strengthens the case for fetal pain very early in the pregnancy?

Dr. ROBINSON. It sure as hell can't weaken it.

Dr. Mahoney. But the argument within the neurosciences about where the seat of pain perception sits, whether it sits primarily in the thalamus, whether it sits primarily in the cortex, or parts of the cortex diffusely distributed, does not today have an answer. I believe that the evidence says that it involves diffusely the cerebral cortex.

I do not do research, neuroscientific research on brains of monkeys or humans, but I have accepted the challenge of the observations that have been cited today. My concern has been with human babies.

Senator Hatch. You are allowing a slight opening there, that there may be something to what Dr. Robinson says.

Dr. Mahoney. Yes.

Senator Hatch. That is quite a bit difference from your opening statement where you said there is no fetal pain.

Dr. Mahoney. My own interest in fetal pain arises from my being a physician concerned about the unborn human baby as well as the newborn human baby. As Dr. Robinson has challenged, I am humanly concerned that I do not do harm or cause pain to my fetal patient, or my newborn patient. Thus, I am very interested in the resolution of this question as to whether there is evidence that the fetus perceives pain and I should therefore want to do something to alleviate or prevent that pain. That is why I have made the effort to try to gather evidence from within the womb, as Dr. Berkowitz has also, to directly test the hypothesis, does the fetus respond to painful stimuli.

Senator Hatch. I take it you will be more interested in doing that following this hearing.

Dr. Mahoney. No. My interest is long-standing. We started observations back in the 1970's, because the question occurred to us then. We are not interested in causing pain to unborn human fetuses. So, we have touched and pushed. We have touched with th sharp end of a needle, stimuli that for us would be clearly painfu We have pinched off pieces of skin, with a biopsy instrument that cuts through the skin. Again, an act that should be clearly painful if pain were preceived. We have not seen a response from the unborn human fetus that suggests it is perceiving pain. That is the most direct evidence that I can bring to the question, but I certainly feel quite invested in its answer.

We do not want to find ourselves giving drugs to an unborn human fetus that will relieve or prevent pain in the child or adult if those drugs are unnecessary. They complicate the care of the woman and they are likely to have dangers for the unborn baby. So to conclude that there is pain there, when there is not, is for us a wrongful act in terms of fetal medicine. It harms our ability to take care of the unborn human fetus in optimal fashion if in fact there is no pain.

The evidence that I have sought and report to you does not suggest that the human fetus is perceiving pain.

Dr. Berkowitz. Senator, I would like to cite a source which probably is not quoted frequently in these halls. It is a Peanuts cartoon that was published a number of years ago——

Senator Hatch. Don't challenge us on that.

Dr. **Berkowitz**. It has Charlie Brown and Linus sitting on a fence on a starry night, looking into the sky, and Charlie Brown asks Linus, is the universe finite or infinite? Linus responds that it is definitely finite. Charlie then asks how can you be sure of that? And I paraphrase, but the answer is, I consider myself to be infallible on matters of opinion.

I think that what we have heard today has been an extraordinary malange of fact, fantasy, and opinion, and I don't think that they have been cleanly dissected at all. As a person who does scientific research and who reads scientific journals, I am, for example, very uncomfortable with the conversation that Senator Humphrey had with Dr. Nathanson about the clear parallel between an amputation on a 1-week-old infant, and a D&E performed at 15 weeks, as if that was fact. That parallel, Senator Humphrey, is clearly open to question.

I can tell you that the overwhelming majority of physicians who have thought about the issue of fetal pain, would have a lot of trouble with that analogy.

Dr. Robinson, who is extraordinarily articulate, as articulate, if not more so, than Dr. Nathanson, gives——

Dr. **Robinson**. It sounds like a charge.

Dr. **Berkowitz**. It isn't the whole answer, is it, to just be articulate? Dr. Robinson gives a figure of 50–50 as to the fact that the fetus was experiencing pain.

Dr. **Robinson**. I was being droll.

Dr. **Berkowitz**. That is the problem. I think it is wrong to be droll about these issues when you are one of a panel of people who are supposed to be authorities on the subject being discussed. No one can put accurate odds on that estimate right now. It is not without question, Senator Humphrey, that the fetus feels pain beyond 15 weeks. That is not clearly established, and in fact, there is an enormous amount of evidence to suggest that it is not true. I just hope that the people in this room listening to this discussion will be able to separate out as much as possible what they have been told as fact, and what they have been told as opinion, but I believe that will be difficult to do when the record is read.

Dr. **Robinson**. I have been charged with being articulate. I should answer that charge. I was attempting to be droll, and I am sorry you missed it. When I said that this is a 50–50 proposition, what I meant was that you could probably bring in an array of data, and that half the findings would support the conclusion that the fetus at 12 weeks is experiencing pain, and half the findings would support the conclusion that the fetus is not experiencing pain. Of course, for the given fetus the outcome is not a 50–50 proposition. There is either pain, or there isn't.

Now, as far as this matter of opinion is concerned, what do we do with scientific data? What is the whole point of gathering scientific data? It is not to fill handbooks.

The point of gathering data is to assemble facts that will tell either for or against a certain theoretical integration. The point of having an integrated theory in science is that you don't have to keep collecting data. We don't keep rolling balls down inclined planes to find out what their acceleration will be.

Thanks to Galileo, we know. We only have freshmen physics students do that now. We have gathered these data, clinical neurological findings, neuropsychological studies and the like.

Where do we stand with respect to the possibility of pain, pain as a sensation mediated early in gestation? Where we stand is here: Those centers in the adult organism known to be central to the experience of pain, those centers which when chemically or electrically stimulated turn off pain, are available to the fetus at 12 weeks. Therefore, we would say there is sufficient equipment at least for us to hazard a guess that pain might be possible.

Now, let's look at the behavior. Ultrasonography is not the only way of visualizing the pain of 12-week fetuses. I can show you photographs of fetuses being stimulated after C sections. Now, do you want to use these behaviors as establishing that there was pain?

I submit to you that many of the behaviors in question are cut from the same cloth that we would use to wrap up a research proposal in which we were going to get government support to study human pain. When you put it all together, what do you have? You have, I say, at least a suggested, or presumptive argument for the possibility of fetal pain at 12 weeks. I don't want to make a crusade out of it. There is warranted evidence that there may be fetal pain at 12 weeks.

Now we can turn to the ethical side of it. If it is warranted that there could be pain, what is it our legislators should be encouraged to do? I would think you would be encouraging by law, and yes, you should encourage the Nation to recognize that, to the extent that this possibility exists, all morally enlightened people should act in such a way as to avoid it.

Senator HATCH. Dr. Nathanson.

Dr. NATHANSON. If I may say one final word for myself, I think what we have heard, Senator, is that some of you who are here who are convinced that there is fetal pain at 12 weeks.

Most of us, I suppose, are in doubt, but no one here, to my knowledge, or anywhere in the scientific community, has categorically denied even the possibility of pain at that time.

So I am endorsing in essence what Dr. Robinson has suggested, namely, when in doubt, give the benefit of the doubt to the morally and ethically correct side of the issue, namely, do no harm.

Now, I am also aware that I am not a research scientist, but I am also aware, and have been for many years, that scientific facts, when collected and assembled, do not exist in a moral vacuum, they must be applied in the correct ethical manner, and this again, is what Dr. Robinson suggests that we cannot stand by uninvolved, and allow this doubt to prevail and still fail to act in the ethically correct way.

Dr. BERKOWITZ. Senator, in medicine today, and I am sure it has always been true, decisions are continuously made based on imperfect knowledge. I don't think there is a day that goes by in my clinical practice where I am not making major decisions with less information than I would like to have.

What one does is to take the information available, weigh it, and try to come to a reasoned decision based on what seems to make the most sense. A principle that I think is pretty universally adhered to in the practice of medicine, and it must apply to many other areas as well, is that when theoretical risks are weighed against demonstrable benefits, you go in favor of the demonstrable benefits.

An example is the ultrasound technology that Dr. Nathanson has used to try to make his case. We are not sure about the ultimate safety of ultrasound. Nevertheless this issue extensively evaluated, and the evidence overwhelmingly suggests that at this time there don't seem to be any harmful bioeffects on human fetuses, embryos, or even ova.

So we come down on the side of the potential benefits of ultrasound versus the theoretical risk of its safety.

All I ask is that we don't try to solve the abortion issue on the basis of concern about theoretical risks. Let's consider the other aspects of the abortion question in making a decision about this issue because theoretical concerns about the possibility that we are hurting a fetus are not the whole story.

There is a great deal more involved, and these larger issues are such that we at this table can only serve as private citizens to discuss them, not as experts.

Senator HATCH. Is there any question that the child is torn apart and destroyed here? I don't think this is a theoretical possibility, that Dr. Berkowitz alludes to. This is a demonstrable fact.

Dr. BERKOWITZ. But the fetus is not the only participant in an abortion. There is a mother, there is a father, there is a society, there are a variety of other issues that relate to the question of abortion rather than just the fetus itself. I think those issues must be considered in and of themselves because they are central to the abortion question.

Dr. NATHANSON. We, I thought, were convened to discuss the issue of the fetus here, and there is only one certainty in abortion, and that there is one corpse from each abortion.

Dr. BERKOWITZ. That is true, but the question before us is does that corpse experience pain before it dies?

Dr. MOSELEY. We are all making the same mistake, which is dragging in the abortion issue into a discussion of fetal pain, and I don't believe that we have what we would call theoretical risks as opposed to tangible benefits when we are discussing fetal pain, all of those that we have studied in medical school tells us that the fetus does have the neurological connections, if you will, to experience pain.

What we are debating is whether or not that pain is perceived, and we have all defined pain as subjective, there is no way of ultimately defining that. Both Dr. Berkowitz and Dr. Mahoney have had extensive experience in the ultrasonography with fetuses, and have reported that they have no evidence to show that fetuses feel pain of needle sticks. Other obstetricians, I know, would dispute that.

There is no way we can prove that the fetus feels pain. However, the burden of evidence, seeing that the connections are there, that it is possible that the child feels pain, and that we really have no way of presuming otherwise, should cause us to assume and give the fetus the same protection that we would give to, say, a subject of child abuse.

When I see a child in the emergency room, with legs that look like they have cigarette burns, and the parents make up some story that the child fell down the stairs, or ran into the radiator, I have no way of proving that they are wrong.

However, I am assuming that based on my medical knowledge, which is the same knowledge that I would hope Dr. Berkowitz and Dr. Mahoney have, and I act accordingly, giving the child the benefit of the doubt.

Senator HATCH. When both the thalamus and the cortex are developed and functioning in a late term child, is there any question that at that point that the fetus would perceive severe pain from an abortion? Would all of you panelists agree on that particular point? When you have both the thalamus and the cortex, they are both developed, they are functioning, in a third trimester child, do any of you have any question that that child would perceive pain?

Dr. MAHONEY. The answer to that question depends on the understanding of pain. Our understanding is incomplete at this time. Still in the last stages of pregnancy, the cerebral cortex is not fully populated with its cells. Some still have to migrate into it, and lots of interconnections still have to be made.

Now, I believe, for my own activities, while taking care of the fetal patient, that in the last stages of pregnancy, I prefer to act as if the fetus may perceive pain, and take measures to prevent that. If I am operating on an unborn human fetus within the womb in the third trimester, that is the way I would act, but I don't believe that there is any agreement as to what that fetus does perceive. I know that earlier in pregnancy, in the fourth and fifth months, when I touch fetuses, when I do things that to you or me would be painful, the fetus does not indicate any response that looks like a perception of pain.

Dr. ROBINSON. This is a very difficult interpretive area. Let me tell you what people thought in the 1940's, which is kind of interesting. They thought that since the fetus was developing in an essentially homogenous environment, it would be so lacking in an experiential history of differential stimulation, that upon entering the world it could provide no interpretive responses to any specific stimulus that came along, and so, although the neonate was capable of differential sensitivity, and different perceptions, it didn't have a behavioral repertoire with which to show in a discriminating fashion precisely the experience it was having.

Now, I should tell you from what that theory derived some of its support from. It derived some of its support from studies of organisms raised in homogenous environments; for example, a dog, would put its snout into a flame and would not withdraw it. Is this evidence that the dog had no nociceptive sensation? No, the dog may only lack the response capabilities necessary for escape behavior.

So I do stand with Dr. Mahoney, and his diffidence on this question. I don't think it would be profitable for science to pretend to answer once and for all, even late in gestation, even at birth. Again, anatomy is sufficient, the growth reflexive behavior is suggestive of the sort of things we get from adult organisms in distress.

If you had to make a bet, given what we ordinarily regard as pain, the bet would be that the organism is experiencing pain.

Can you declare it categorically? No. It is a private experience, you see.

How do I know you have a toothache? You tell me. You might be lying. This is an area in which philosophers differ. When we say when it comes to first person report of experience, the individual having the experience has final proprietorship of his own claims. When you say you have a pain, there isn't anything I can do to prove you don't.

In the human community, we come to rely on each other's veracity, and on our kindred relationship. When it comes to nonverbal organisms, we don't have that, so everything turns out to be a surmise, and the question is, Is it a good or sound surmise, or is it a reckless one?

The surmise that the 12-week fetus is in distress, and experiences pain, is not a reckless surmise, and the older that fetus gets, the progressively less of a surmise it is.

Dr. **Berkowitz**. Senator, I just would like to return for one brief moment to the argument that since fetal pain might exist abortions should be abandoned because of the principle that above all we should do no harm. I think that if that principle is going to be evoked, we don't have to go to the issue of pain, because, for the fetus, an abortion has no possible benefit, and the outcome clearly is harmful.

There is no question about that. We don't have to talk about pain to make the case. The reason that we are talking about pain, is that there are other issues involved. If those other issues deserve consideration, then they ought to be considered on their own merits when weighed against the theoretical possibility of the existence of fetal pain, because if we just use the argument that we should do no harm, we don't have to go any further.

That is where the argument ends, and we don't have to have a subcommittee devoted to the issue of fetal pain.

Senator **Hatch**. Let me turn to Senator Humphrey.

Dr. **Moseley**. I would like to make a reply to Dr. Mahoney, when he talks about, he chooses to believe that the late term fetus feels pain. I don't know what his definition of late term fetus is, but if we are talking extremely late, we are talking 7, 8 months gestation.

Dr. **Mahoney**. Even earlier than that outside womb.

Dr. **Moseley**. Are we talking 35, 36 weeks?

Dr. **Mahoney**. No. The babies that you take care of, and I take care of, at 24 to 26 weeks act as if they perceive pain.

Dr. **Moseley**. Exactly. Because if there is a question as to that, I would only invite them to come to any newborn nursery, because infants are born as early as 34 to 35 weeks, who are healthy enough to go home on the third day with their mother. Those infants, if they happen to be male, are usually subjected to circumcision. That is done in the vast majority of cases without anesthesia, and if you believe that there is no pain perception, I invite any of you to stand by, or wait for any of these infant boys to sleep through the moment where the clamp is applied to their foreskin and crushed, so blood control will be achieved for that circumcision.

So it is quite obvious that late term fetuses which are known as——

Senator HUMPHREY. I have only a few questions, but first an extension of some of my earlier remarks.

I want to make it clear that my condemnation of the medical community is only toward those who, as I see it, are negligent in ethical matters, in this case, in failing to provide counsel to mothers that their unborn child may well feel pain.

I was too broad in my condemnation. I wanted to make that clear. It is not true that all politicians are crooks, any more than I might have suggested that the entire medical community is culpable in this case.

Second, I want to make it clear, as I think a number of others have, that the overriding narrow issue is pain. I regard the ethical question of whether it is the right to take the life of an unborn human being, except in the cases of self-defense, but the question of pain is not immaterial or irrelevant, and so to return presumably to the focus of this hearing, Dr. Moseley, you said, and reiterated that it is extremely probable that the fetus does experience pain.

Well, in your medical opinion, then, as a physician, should women be counseled about the likelihood, as you see it, that women who are opting for abortion, should they be counseled of the likelihood that the unborn child, infant, human person, fetus, call it what you will, will experience pain in the sense that we do in everyday life experience pain?

Dr. MOSELEY. Yes, I do. I find it extremely paradoxical, in a situation where I am called to see a sick child who needs several medical procedures done, that I have to go with a long paper of an informed consent for the parents, explain the possibility of medical complications to do a procedure such as a lumbar puncture, to save the child's life, but a woman, not really intent, in not knowing the full extent of what she is doing, gets no information whatsoever with regard to any pain it might experience upon the abortion of an unborn child.

Senator HUMPHREY. In your capacity as not only a physician, but also a physician who also who happens to be a woman, you have a special perspective that our other witnesses do not have. Then as a woman, who is a physician, or as a physician who is a woman, you advocate, then, that women should be counseled.

Do you feel that knowledge of pain has been withheld from women, and do you feel as a woman that women should be more apprised of that possibility?

Dr. MOSELEY. I think knowledge not only of the possibility of pain perception of the fetus, but the uterine development of the fetus has been withheld. I have been party in one sense, on the end of multiple abortions during the course of my training, both spontaneous and induced, and in many cases, and we are talking not really late term, we are talking from 12 weeks to beyond, when these mothers, especially on spontaneous abortions were asked, did they want to hold, see, visit with their unborn child, and the child was brought to them, they were surprised that the infant looked like a baby, responded like a baby, and was essentially a miniature infant.

Senator HUMPHREY. Dr. Berkowitz, I have empathized with you, because when I try to educate people with regard to the reality of abortion, I am met with hostility and silence.

You still can't be certain in your minds that the unborn feels pain as we know it prior to birth. Is that a correct interpretation of what you said?

Dr. BERKOWITZ. Yes, it is.

Senator HUMPHREY. How about the week prior to birth?

Dr. BERKOWITZ. I think we go back to the answer that Dr. Mahoney gave, which is that we can't be absolutely certain about this issue even in neonates. I think that what you would like me to say is that, yes, it exists the day after birth, so clearly it exists the day before birth, and if the day prior to birth, then why not 2 weeks earlier and we can then slide on down to conception.

I won't play that game, because I don't know the answer.

Senator HUMPHREY. Shouldn't there be a presumption in favor of this being at some point?

Dr. BERKOWITZ. Senator Humphrey, let me make one fundamental point in answering that. I spend my professional life trying to take care of fetuses. I try to diagnose and then take care of their problems. To me, perhaps more than to any other person in this room, with the exceptions of Doctors Mahoney and Moseley, these fetuses are very, very real.

I look at them with ultrasound, I worry about them. I take care of them. It is the whole focus of my professional existence.

When I tell you that I don't think a fetus feels pain, I am telling you that on the basis not of moral judgments that I make about abortion, but based on my perceptions of what I have witnessed in fetuses that I have physically manipulated in utero. I make these comments absolutely honestly, and based, I think, on much greater firsthand experience than anybody else in the room, with the possible exception of Dr. Mahoney, who has done a large number of fetoscopies. I don't think fetuses feel pain in the second trimester, because I have witnessed time and time again painful stimuli not causing the type of responses that I associate with pain.

Senator HUMPHREY. How about in the third? Have you had that experience in the third?

Dr. BERKOWITZ. I don't have nearly as much experience with manipulating fetuses in utero during the third trimester. The reason for that is, in most cases, during the third trimester the most effective form of fetal therapy is delivery in order to transfer the fetus from the uterus to a newborn special care nursery. I therefore can't really answer your question directly.

Senator HUMPHREY. Let me ask this last question.

Do you think women ought to be counseled about the potential, at least, or the likelihood, as some see it, that the being which she conceived and is carrying would experience substantial pain in an abortion?

Dr. BERKOWITZ. I believe that every patient having any kind of medical or surgical procedure should know as much about it as possible. But now we are getting into the area of what she should be told.

I have two comments about that. No. 1, through the years, I have taken care of hundreds and hundreds of women who have had abortions done prior to their coming to me with another pregnancy, and I can tell you that the overwhelming majority of these women who have electively had abortions, not all, but the overwhelming majority, have tremendous deep-seated psychological reactions to having gone through this process. They have a very real awareness of the fact that there was a tiny, recognizable human being inside them, and they didn't undergo the procedure with their eyes closed and their heads in the sand unprepared for that realization.

No. 2, I am unfamiliar with the article Dr. Nathanson cited from the "New England Journal of Medicine," but I can tell you that to my knowledge most places in the United States today routinely perform ultrasound examinations prior to second trimester abortions. This is done in order to accurately date the pregnancy, and the mother is awake and looking at the ultrasound screen during the scan. In most of the cases the mother is totally aware of what she is looking at on the screen, there is a discussion about what she is seeing, and the opportunity for bonding exists. Yet the overwhelming majority of these patients proceed with the abortion.

So I do believe that women should know what is going on, but I don't think that that means that they should be told that their fetus will feel pain. Clearly there are many ways to impart information.

Senator HUMPHREY. You raised another point, and I don't want to digress. I think it an important point.

Do you think that women should be counseled, in your experience, at least, borne out by others that they can, and many will suffer a substantial psychological distress from having an abortion?

I don't think that happens in these walk-in abortion clinics, or their unborn experiencing pain.

Do you think women should be counseled about adverse psychological effects?

Dr. BERKOWITZ. We are getting into my personal opinion of things and I don't think that it is any more valid than that of anyone else in the room.

Senator HUMPHREY. I want your professional opinion. You have had professional experience, as you said, with a majority of women who have had abortions, who had suffered substantial psychological effects. Most women have been told, this is no big deal, don't worry about it. Don't you think they should be counseled as what you have experienced as substantial psychological damage?

Dr. BERKOWITZ. What I would say now is what I just said. I think women should know as much as possible about the abortion procedure. I believe that counseling should be administered prior to any abortion, and that that counseling should go into things other than the purely technical aspects of what is going to transpire, but, Senator Humphrey, I honestly don't know how often that is and is not done. I can tell you that many of the women I have spoken to, who had undergone these procedures, have known full well beforehand what the potential psychological risks would be.

I mean, I really believe that the case for naivity on the part of the American woman having these procedures done is being overstated.

Senator HUMPHREY. Dr. Mahoney, do you think women should be counseled about the possibility of pain? Are you satisfied as a member of the profession, are you satisfied with the performance of your profession on this point?

Dr. MAHONEY. I don't know the performance of my profession in the abortion arena. I hear your claims, and other claims about what is going on. I certainly do believe that the American woman, that women worldwide, should understand the facts about fetal development. There should be no conception of the human fetus as tadpole-like, as frog-like, when that is not true.

The information that we are learning about the developing human fetus should be public. Women should know it. Abortion is a tragic, moral option, I believe. Those women who elect it must also find their other options which they are considering, to be equally tragic in a moral sense.

I have difficulty in putting myself in their shoes. I do believe that anybody under that kind of stress should have information that will be useful to herself. If that includes a high risk of depression, post-abortion, I think she should know that, yes.

I don't know the statistics about how often depression occurs, how often untoward behavioral effects occur after abortion. If they do occur, if they can be predicted, that should certainly be communicated, and they should be prevented.

Senator HUMPHREY. Thank you, Mr. Chairman.

Senator HATCH. This has been one of the most stimulating hearings I have ever held. The way I would summarize this is that neurolocial apparatus is present for pain perception as early as eight weeks in fetuses and when painful stimuli are introduced, the fetus, even early in pregnancy, as shown by the sonograph, reacts aversively and, therefore, I think there should be a presumption in favor of a fellow member of our human family.

I think all of you have been very, very interesting to listen to. I think it has been really a very stimulating hearing, and I want to congratulate all of you on taking time to be with us.

Some of the questions raised were not easy questions. Some of them were perhaps a little irritating. Some of the comments were a little irritating back and forth, but I congratulate each of you for feeling as you do about this particular subject. Those are the conclusions that I would summarize these hearings with.

I would submit for the record a study entitled "Fetal Pain and Abortion, the Medical Evidence," authored by several leading authorities; a letter to the President signed by 26 eminent physicians, several quotes on fetal pain, some news articles, a submission for the National Right To Live Committee. And in particular I would like to include an article by Dr. John T. Noonan, Jr., focusing on fetal pain several years ago, and we will put the written testimony of Mr. Sulander regarding fetal pain into the record as well.

I will keep the record open if any of you would care to submit additional information to us for the record.

[The documents referred to follow:]

Fetal Pain and Abortion: The Medical Evidence

By:

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PREFACE

On January 30, 1984, President Reagan sparked controversy in a speech to the National Religious Broadcasters convention when he asserted, "Medical science doctors confirm that when the lives of the unborn are snuffed out, they often feel pain, pain that is long and agonizing." Restating this on March 6, 1984, the President said, "[A]s abortions are performed, the unborn children being killed often feel excruciating pain."

Dr. Ervin E. Nichols, Director of Practice Activities for the American College of Obstetricians and Gynecologists (ACOG), an organization that supports the practice of abortion, initially denied the President's contention. *The New York Times* quoted Nichols on January 31 as saying, "We are unaware of any evidence of any kind that would substantiate a claim that pain is perceived by a fetus." Later, however, Dr. Nichols told columnist John Lofton that "the reporting of his views has been only 'partially correct,' that he was talking in the context of the development of the unborn during its first three months and probably the next month and a half. He says he is not a fetal surgeon and lacks both 'expertise' and 'intimate knowledge' of this field" (*The Washington Times*, February 10, 1984).

Reacting with other proponents of abortion, columnist Ellen Goodman also attacked Reagan's first statement. Yet not long afterward, she, like Dr. Nichols, felt the need to publicly refine her position. "At some midpoint in pregnancy" Goodman acknowledged on February 28, "a fetus undoubtedly experiences what anyone would fairly describe as pain" (*The Washington Post*). She suggested that prohibiting abortions after 20 weeks gestation might help to address this situation.

Goodman's reconsideration of abortion, and perhaps that of many others, is very likely due to a letter that was sent to President Reagan on February 13. Fully backing the President's claims on fetal pain, it was signed by two past presidents of ACOG; Dr. Vincent J. Collins, Professor of Anesthesiology at Northwestern University and the University of Illinois, and author of *Principles of Anesthesiology*, one of the leading medical texts on the control of pain; Dr. Bernard Nathanson, Clinical Assistant Professor of Obstetrics and Gynecology at Cornell University and former Director of New York City's Center for Reproductive and Sexual Health, once the nation's largest abortion clinic; Dr. Bernard Pisani, President of the New York State Medical Society, and Professor of Obstetrics and Gynecology at New York University; and 21 other prominent medical specialists. "Mr. President," the letter said, "in drawing attention to the capability of the human fetus to feel pain, you stand on firmly established ground."

What is that firm ground of medical evidence for fetal sensitivity to pain in the abortion process? If fetal pain is considered a decisive moral contraindication to abortion, would a cut-off on abortions beyond 20 weeks adequately address the problem, as Goodman implies? The following study, written by Dr. Vincent Collins, one of the afforementioned co-signers of the letter to the President, with Dr. Steven R. Zielinski and attorney Thomas J. Marzen, explains that as early as 8 weeks, and certainly by 13½ weeks of gestation, unborn human beings are pain-sensitive. Increased public empathy for these who are unable to speak for themselves, as always, remains the key to reform of America's current and devastating abortion policy.

Steven Baer
Director of Education
Americans United for Life

February 13, 1984

President Ronald Reagan
The White House
Washington, DC 20500

Mr. President:

As physicians, we, the undersigned, are pleased to associate ourselves with you in drawing the attention of people across the nation to the humanity and sensitivity of the human unborn.

That the unborn, the prematurely born, and the newborn of the human species is a highly complex, sentient, functioning, individual organism is established scientific fact. That the human unborn and newly born do respond to stimuli is also established beyond any reasonable doubt.

The ability to feel pain and respond to it is clearly not a phenomenon that develops de novo at birth. Indeed, much of enlightened modern obstetrical practice and procedure seeks to minimize sensory deprivation of, and sensory insult to, the fetus during, at, and after birth.

Over the last 18 years, real time ultrasonography, fetoscopy, study of the fetal E.K.G. (electrocardiogram) and fetal E.E.G. (electroencephalogram) have demonstrated the remarkable responsiveness of the human fetus to pain, touch, and sound. That the fetus responds to changes in light intensity within the womb, to heat, to cold, and to taste (by altering the chemical nature of the fluid swallowed by the fetus) has been exquistely documented in the pioneering work of the late Sir William Liley--the father of fetology.

Observation of the fetal electrocardiogram and the increase in fetal movements in saline abortions indicate that the fetus experiences discomfort as it dies. Indeed, one doctor who, the New York Times *wrote, "conscientiously performs" saline abortions stated, "When you inject the saline, you often see an increase in fetal movements, it's horrible."*

We state categorically that no finding of modern fetology invalidates the remarkable conclusion drawn after a lifetime of research by the late Professor Arnold Gesell of Yale University. In "The Embryology of Behavior: The Beginnings of the Human Mind" (1945, Harper Bros.), Dr. Gesell wrote, "and so by the close of the first trimester the fetus is a sentient, moving being. We need not speculate as to the nature of his psychic attributes, but we may assert that the organization of his psychosomatic self is well under way."

Mr. President, in drawing attention to the capability of the human fetus to feel pain, you stand on firmly established ground.

Respectfully,

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Fetal Pain and Abortion: The Medical Evidence

Vincent J. Collins, M.D.*
Steven R. Zielinksi, M.D.**
Thomas J. Marzen, Esq.***

The possibility that the human fetus feels pain introduces a new element into the moral discourse, and public policy debate, on abortion.

One can describe the anatomical and physiological development of the unborn—catalogue the body parts as they come into existence, describe their functions, measure their size. Evidence of this sort might or might not convince one that the fetus is sufficiently similar to the child or adult to be reckoned of equivalent value, depending on the predilections of the evaluator. A conviction based on such information, however, depends largely on visual analogy or identification of common features and functions, rather than an identification with the feeling state of the fetus. Empathy, or a certain resonation with the sensitivities of the fetus may develop, but only by implication or inference.

The prospect of fetal pain—pain that results from abortion—cuts through philosophical abstractions and scientific nomenclature, proceeding directly to the heart. A being that feels pain makes an urgent demand for recognition, a demand we know through the experience of our own bodies rather than because of any cool, deductive need of our minds for logical consistency. Real pain cannot, we know, be easily denied or rationalized: It simply exists, and it commands immediate attention. Internalized knowledge that the fetus feels pain forces us to focus on a common feeling state we share with him or her, a state that cuts much closer to what we identify as the essence of life than any mechanistic vision of an assembly of functioning body parts.

The significance of this lies in the tendency of most people to make ethical and political judgments based on empathetic or sympathetic impulses that have little to do with reason or notions of justice. Abortion is approved or tolerated largely because of feelings of sympathy for the pregnant woman, which are seen to conflict with and override any objective evaluation of the moral content of her conduct. But an understanding of fetal pain, assuming its reality, counterbalances the claim the woman makes on the emotions: True, the woman *might* be "hurt" in some sense if abortion were not available to her; but her unborn child will surely experience deadly pain if he or she is subjected to abortion. Implicit in this line of reasoning is an identification with the fetus formerly reserved only for the woman. The fetus is humanized, and conflicting sympathies

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create the need to seek more objective criteria in evaluating the legitimacy of the proposed abortion–criteria that already assume that the fetus has some just claim on our feelings and sense of equity.

That a fetus can feel pain should not be a difficult concept to comprehend. Most of us have had the opportunity to hold an infant in our arms and see its response to touch. We have seen and heard a very young child's objection to the irritation of diaper rash, to pangs of hunger, and to the careless poke of a sibling. We know the response of the newborn to the doctor's slap just seconds after birth. Laymen and physicians alike interpret this response to be precisely what it is–a response to the sensation of pain. The baby crying just moments after birth surely had the same capacity to feel pain in the womb just a few moments prior to birth.

But how far back during the course of gestation can it be stated, with reasonable medical certainty, that the human fetus can and does sense pain? On what grounds would such a conclusion rest? Can some abortions, during the times of gestation they are performed, be said to cause fetal pain?

As with a newborn infant, a comatose or uncommunicative adult–or, indeed, as with animals–one is unable to secure from the human fetus a confirmation through speech, or some other intelligent sign, that pain has been sensed. The fetus is not able to state, "I feel pain," which is the indicia of pain that a physician would usually rely on when treating a patient who can verbalize. With a communicative patient who says that he or she feels pain, the physician can only conclude either that the pain exists in somatic or psychosomatic form, or that the patient is lying. Excluding the possibility of the lie, the physician concludes either that the pain is real, or that it is imagined but psychologically "real" to the patient nonetheless. Yet when diagnosing pain in an organism that *cannot* intelligently communicate–like a newborn infant, a comatose adult, an animal, or a fetus–one is compelled to rely on other criteria.

It is essential to emphasize that failure or inability to communicate the existence of a painful sensation does not diminish the potential import or severity of pain suffered by an organism. A physician would not think of performing major surgery on a newborn child without anesthesia. Neither would a veterinarian perform surgery on a dog without pain-killers. It is assumed that the child and animal suffer pain because it is known that each organism has certain neurological systems in place, and that certain responses will be evoked if certain things are done to the child or animal–things which, if done to any one of us, would cause pain. The judgment that pain exists in *any* organism is ultimately based on an inference drawn from experience rather than on physical evidence: It would cause pain to me if done to me; therefore, it causes pain to him. One cannot presently "know" that any organism senses pain in the sense that one can know that another has a cancerous tumor or a bad heart. After all, even the communicative adult could, as with some insurance claims, be lying about the pain said to be felt.

Yet this does not mean that pain is any less real than cancer–one who suffers excrutiating pain knows how very real it is. It simply means that the conclusion that pain is felt by another is reached by way of indirect evidence rather than by way of any direct proof.

The mere testimony of a communicative, conscious adult that he or she feels pain is *not* direct, or even the best, evidence of pain because it depends on his or her veracity rather than on physical evidence. From the standpoint of medical practice and science, organic or physiologically based pain is finally judged to exist when anatomical structures necessary to pain sensation are in place, when physiological responses normally associated with pain occur, and when some cause associated with induction of a pain response is present. Put another way, the physician will judge that pain exists if the necessary biological sensory machinery is there, if something causes a response like that which pain would cause and if that "something" is indeed capable of eliciting such a response in human beings generally. This approach focuses on the verifiable existence of neurological systems and the reactions of organisms to stimuli in identifying the presence of pain. From this perspective, verbalization of a communicative and conscious adult is a mere elaboration or a type of pain response that is ancillary to pain sensation, rather than a prerequisite to its existence.

Neurological Structures and Functions Necessary to Pain Sensation

Certain neurological structures are necessary to pain sensation: pain receptive nerve cells, neural pathways, and the thalamus.

There are two types of nerves: motor and sensory. Motor nerves are involved in functions related to movement. Sensory nerves carry pain, positional, thermal, vibratory, and tactile data.

In the skin and throughout the body are free nerve endings that act as pain receptors and are part of pain sensory nerves. These pain receptive cells, called nociceptors, are sensitive to pressure, mechanical stress (stress that results when body tissue is punctured, crushed, or broken), heat, and chemical invasion. When a nociceptor is affected by a noxious stimulus—something that is harmful or potentially harmful to the cell—it discharges an electrical impulse that travels through interfacing nerve fibers to the spinal cord, and often to the brain.

The spinal cord and brain are together defined as the central nervous system; nerve fibers not completely contained in the spinal cord or brain constitute the peripheral nervous system. The electrical impulses in *motor* nerves travel almost exclusively from the central nervous system to the peripheral system, whereas in *sensory* nerves, such as those that carry pain impulses, impulses travel primarily from the peripheral to the central nervous system.

When a pain-associated electrical impulse travels from a nociceptor, through the fibers of the peripheral system, and arrives at the spinal cord, it is transfered to spinal cord fibers. Interface occurs in the dorsal (posterior) horns of the cord. The pain impulses then travel up the cord primarily in the spinothalamic tract (*i.e.*, in a pathway that runs through the cord into the thalamic portion of the brain).[1]

It is possible, however, for pain impulses to generate a more direct response without first traveling to the brain, a response made possible by a complex network of interfacing motor and sensory fibers in the spinal cord. When such a motor reaction occurs not involving the brain, but only the spinal cord and peripheral system, it is referred to as a "reflex." Reflexive responses are simple and direct—of the type that occurs in the leg when the knee is tapped with a light hammer. Pain sensation is not necessarily involved in reflexive responses because the brain, where pain is sensed, is not necessarily involved.

When the pain impulse travels up the spinal cord to the brain, however, another kind of response is possible: an "aversive" response. Aversive responses represent the body's attempt to escape noxious stimuli.[2] They involve the more controlled avoidance responses to pain that we normally associate with pain sensation; they are direct evidence that a pain impulse has reached the brain, which is where pain is sensed.

The critical neurological structure in the brain for pain sensation and response is the thalamus. Both animal and human studies underscore its central function:

> Aversive behavior can be elicited by stimulation in or near the PO [posterior thalamic] nucleus in [the] cat. In humans there is evidence that electrical stimulation within the posterior ventrolateral thalamus elicits painlike behavior and reports of pain.[3]
>
> * * *
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> Currently the weight of available evidence seems, in our opinion, to support the view that neurons in the posterior lateral thalamus are necessary for the normal recognition and localization of noxious somatic stimuli. Neurons within the medial and intralaminar thalamus, however, appear to mediate a variety of equally essential functions in pain mechanisms. These functions may include the initiation of arousal, aversive affective mechanisms and behavior, autonomic and somatic motor responses, and the activation of endogenous control mechanisms that attenuate responses to noxious stimuli.[4]

The thalamus lies above the spinal cord and brainstem, but below the cerebral cortex, which is the portion of the brain associated with sophisticated motor activity, cognitive function, and, in human beings, consciousness. Pain impulses that reach the thalamus can be further transmitted to the cortex, where they may generate sophisticated motor responses and cognitive associations.

But the presence of a functioning cortex is not necessary to pain sensation. Even complete removal of the cortex does not eliminate the sensation of pain;[5] no portion of the cortex, if artificially stimulated, results in pain sensation.[6] It follows, therefore, that neither the presence of the cortex nor transmission of pain impulses to the cortex are essential to pain sensation. When the cortex (which develops and functions later in human gestation than the thalamus) is involved in a pain response, it generates elaborated aversive behavior and adds psychological and cognitive components to pain sensation.

The requisite structures for the sensation of pain are, therefore, the nociceptors, a continuous neural pathway of sensory nerves that transmit pain impulses from the nociceptor through the peripheral nervous system and the spinal cord to the thalamus, and the thalamus. In order to determine that pain is sensed, however, these structures must not only be in place, but also known to be *functioning*. It may someday be possible to measure biochemical or electrical activity in the brain to conclude that pain is sensed, regardless whether any other response occurs or is possible. At present, however, the physician concludes that pain is sensed when some motor response is elicited by a pain stimulus–in particular, when an organism with the requisite neurological structures evidences aversive behavior.

When does the human fetus have the requisite neurological structures necessary to sense pain and respond aversively to noxious stimuli?

Pain in the Human Fetus

Functioning neurological structures necessary for pain sensation are in place as early as 8 weeks, but certainly by 13½ weeks of gestation. Sensory nerves, including nociceptors, reach the skin of the fetus before the 9th week of gestation.[7] The first detectable brain activity occurs in the thalamus between the 8th and 10th weeks.[8] The movement of electrical impulses through the neural fibers and spinal column takes place between 8 and 9 weeks gestation.[9] By 13½ weeks, the entire sensory nervous system functions as a whole in all parts of the body (except in the skin or the back of the head).[10]

Concurrent with the development of the sensory structures is the emerging responsive behavior of the fetus. By the end of the 5th week, a tap on the mouth of the fetus will cause the lips to draw back.[11] By 10 weeks, the palms of the hands are sensitive to touch, and at 11 weeks the face and extremities likewise respond to tactile stimuli.[12] By 13½ weeks, these responses are sufficiently elaborate and sufficiently avoidant to warrant the definite conclusion that the fetus responds aversively, not reflexively. They evidence an integrated physiological attempt to escape noxious stimuli.[13] In response to experiments performed on 12 to 16 week fetuses, movements of the head, body, and limbs have been observed. These movements were vigorous, and consisted of ventro–or dorsoflexion of the trunk, flexion of the limbs, and turning of the head, indicating the presence of acute fetal pain.[14] It is agreed that a fetus must be heavily sedated before intrauterine manipulation, such as transfusions, because such painful stimuli cause the fetus to move, making the procedure difficult.[15]

> When doctors first began invading the sanctuary of the womb, they did not know that the unborn baby would react to pain in the same fashion as a child would. But they soon learned that he would. By no means a "vegetable," as he has so often been pictured, the unborn knows perfectly well when he has been hurt, and he will protest it just as violently as would a baby lying in a crib.[16]

* * *

> We know the fetus can feel pain. For example, blood can be

transfused directly into the abdominal cavity of the fetus by means of a long, thin hypodermic needle. Of course, the obstetrician can see the fetus under the fluoroscope and easily insert the needle without injury to lungs, liver, or heart. Nevertheless, the upper portion of the hypodermic needle, which still protrudes from the mother's abdomen, can be seen moving about, indicating the fetus is trying to escape this slightly painful object.[17]

Thus, because the requisite neurological structures are present at that time and because they are functioning, as evidenced by the aversive response of the human fetus, it may be concluded with reasonable medical certainty that the fetus can sense pain at least by 13½ weeks. Because the neurological structures are at least partially in place between 8 and 13½ weeks, it seems probable that some pain can also be felt during this time of gestation.

The Evidence of Pain from Abortion

Induced abortion will cause pain to a fetus with a functioning nervous system if the method used stimulates the pain receptors, excites the neural pathways, and the impulse reaches the thalamus. Dilatation and evacuation (D & E), abortion, abortion by saline amnio-infusion, and prostaglandin abortions are capable of stimulating pain receptors and exciting neural pathways. These methods of abortion are employed during times in gestation when the fetus can sense pain. It must be concluded, therefore, that they cause pain to the fetus.

D & E abortions are performed after the 12th week of pregnancy (and are performed up to and including the period of viability) when fetal bones are too large and brittle and the size of the fetus is too great for standard first trimester abortion techniques. D & E involves the progressive dismemberment of the fetus prior to extraction in order to facilitate removal of the fetal parts from the uterus.[18] The slicing and crushing involved in dismemberment of the fetus in D & E abortions would obviously excite pain receptors and stimulate the neural pathways, thereby evoking an aversive response in the fetus whose central nervous system is functioning. It must be concluded, therefore, that the fetus suffers pain as the result of D & E. abortion.

Abortions by saline amnio-infusion are performed after the 14th week up to and including the period of fetal viability.[19] The procedure involves the insertion of a hypodermic needle into the amniotic sac to remove the amniotic fluid. In substitution, a hypertonic (highly concentrated) solution of sodium chloride (salt) is injected into the sac. This solution disrupts the placenta, causing fetal expulsion in up to 48 hours after the time the solution is injected.[20] During that period, the corrosive action of the saline solution burns away the upper skin layers of the fetus.[21] The esophagus and mouth are also burned when the fetus swallows amniotic fluid polluted by the saline. By the time the fetus is expelled there is extensive edema and submembranous degeneration.[22] By damaging the surface of the fetus in this fashion, saline would excite pain receptors and stimulate the neural pathways of a functioning central nervous system during the course of the abortion and until the fetus dies.[23] It is well-known that the fetus reacts with aversive responses when saline is introduced into amniotic fluid. The aborting mother can feel her baby thrashing in the uterus during the approximately two hours it usually takes for the saline solution to kill the fetus.[24] It must be concluded, therefore, that the fetus feels pain as the result of saline amnio-infusion abortion.

The method of abortion involving the introduction of prostaglandin into the mother's system may bring about death of the fetus by constricting the circulation of the blood and/or impairing the heart function.[25] Pain analogous to that of a person experiencing a heart attack can be assumed.

To the extent that the fetus between 8 and 13½ weeks of gestation feels pain, the suction curettage method of abortion—the usual method of abortion used during that time, which tears the fetus from the womb, often part by part, by vacuum aspiration—is certainly capable of causing pain in a manner analogous to D & E abortion.

CONCLUSION

The medical evidence plainly points to the existence of pain sensation in the human fetus, at least from the onset of the second trimester of pregnancy, and perhaps during the last weeks of the first trimester. It indicates that at least three methods of abortion cause fetal pain.

During the second and third trimesters of pregnancy, approximately 113,500 abortions were performed in the United States by D & E, saline amnio-infusion, or prostaglandin induction in 1980 alone. Of these, approximately 80,000 were by D & E, approximately 24,000 by saline amnio-infusion, and approximately 9,600 by prostaglandin induction.[26]

During the period after the 8th and before the 13th week of pregnancy, approximately 480,500 abortions were performed.[27]

We cannot measure the sum agony of these human beings. We can only know that it was real, hope that it was mercifully brief, and grieve because the ideology that so arrogantly asserts abortion as a "right" has subverted simple human compassion to such a degree that these young human beings continue to die with little or no concern for their pain.

FOOTNOTES

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February 13, 1984

President Ronald Reagan
The White House
Washington, DC 20500

Mr. President:

As physicians, we, the undersigned, are pleased to associate ourselves with you in drawing the attention of people across the nation to the humanity and sensitivity of the human unborn.

That the unborn, the prematurely born, and the newborn of the human species is a highly complex, sentient, functioning, individual organism is established scientific fact. That the human unborn and newly born do respond to stimuli is also established beyond any reasonable doubt.

The ability to feel pain and respond to it is clearly not a phenomenon that develops de novo at birth. Indeed, much of enlightened modern obstetrical practice and procedure seeks to minimize sensory deprivation of, and sensory insult to, the fetus during, at, and after birth.

Over the last 18 years, real time ultrasonography, fetoscopy, study of the fetal E.K.G. (electrocardiogram) and fetal E.E.G. (electroencephalogram) have demonstrated the remarkable responsiveness of the human fetus to pain, touch, and sound. That the fetus responds to changes in light intensity within the womb to heat, to cold, and to taste (by altering the chemical nature of the fluid swallowed by the fetus) has been exquisitely documented in the pioneering work of the late Sir William Liley--the father of fetology.

Observations of the fetal electrocardiogram and the increase in fetal movements in saline abortions indicate that the fetus experiences discomfort as it dies. Indeed, one doctor who, the New York Times wrote, "conscientiously performs" saline abortions stated, "When you inject the saline, you often see an increase in fetal movements, it's horrible."

We state categorically that no finding of modern fetology invalidates the remarkable conclusion drawn after a lifetime of research by the late Professor Arnold Gesell of Yale University. In "The Embryology of Behavior: The Beginnings of the Human Mind" (1945, Harper Bros.), Dr. Gesell wrote, "and so by the close of the first trimester the fetus is a sentient, moving being. We need not speculate as to the nature of his psychic attributes, but we may assert that the organization of his psychosomatic self is well under way."

Mr. President, in drawing attention to the capability of the human fetus to feel pain, you stand on firmly established ground.

Respectfully,

Dr. Richard T. F. Schmidt
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University of Cincinnati
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Dr. Fred Hofmeister
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(More signatories on next page)

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WASHINGTON POST

Nov. 5, 1981

George F. Will

Abortion Does Cause Pain to Its Victims

In the eight years since the Supreme Court nationalized the abortion controversy, one facet of that subject has been neglected: pain. Abortion is painful for the aborted.

The neglect is explainable. To opponents of abortion, death, not pain, is the paramount issue. And proponents of abortion need (emotionally or logically, or both) to deny the possibility of fetal pain.

In its 1973 decision legislating abortion on demand, the Supreme Court announced that fetal life is not alive. At least that is what the court seems to have meant (if it can be said to have meant anything) when it described the fetus as "potential life." Those who support the 1973 decision are committed to the idea that a fetus, being only "potential" life, cannot feel pain, pain being an attribute of actual life.

Thus does a legal absurdity breed a biological falsehood. This intellectual train wreck is the subject of an essay in The Human Life Review by Prof. John Noonan of the University of California (Berkeley) Law School. There are, he notes, four principal means of abortion.

Sharp curettage involves a knife killing the fetus (if the amateur embryologists on the court will allow us to speak of "killing" life that is merely "potential"). In suction curettage, a vacuum pump sucks out the fetus in bits (and a knife cleans out any remnants). In second trimester and later abortions, a saline solution is injected into the amniotic fluid. The salt seems to act as a poison; the skin of the fetus, when delivered, resembles skin soaked in acid. If by accident the solution leaks into the body of the mother, she experiences pain that is described as "severe." The fetus can be in this solution for two hours before its heart (a stubborn bit of "potential" life) stops beating. Alternatively, the mother can be given a dosage of a chemical sufficient to impair the circulation and cardiac functioning of the fetus, which will be delivered dead or dying.

A fetus, like an infant or an animal, has no language in which to express pain. But we infer, and empathize with, the pain of creatures, such as baby seals, which lack language to express pain.

There are uncertainties about the precise points in fetal development at which particular kinds of sensations are experienced. But observations of development and behavior indicate that by the 56th day, a fetus can move. Discomfort may occasion the movement. Tactile stimulation of the mouth produces reflex action about day 59 or 60. By day 77 the fetus develops sensitivity to touch on hands, feet, genital and anal areas, and begins to swallow. Noonan believes that the physiological literature teaches that "beginning with the presence of sense receptors and spinal responses, there is as much reason to believe that the unborn are capable of pain as that they are capable of sensation."

Americans are proud of their humane feelings and are moved by empathy. Thus, we regulate the ways animals can be killed. Certain kinds of traps are banned. Cattle cannot be slaughtered in ways deemed careless about pain. Stray dogs and cats must be killed in certain humane ways.

But no laws regulate the suffering of the aborted. Indeed, Planned Parenthood, the most extreme pro-abortion lobby, won a Supreme Court ruling that it is unconstitutional to ban the saline abortion technique. That's right: the court discovered that the "privacy" right to abortion, which right the framers of the Constitution neglected to mention, even confers a right to particular abortion techniques.

Most pro-abortion persons have a deeply felt and understandable need to keep the discussion of abortion as abstract as possible. They become bitter when opponents use photographs to document early fetal development. The sight of something that looks so much like a child complicates the task of trying to believe that there is nothing there but "potential" life. And if fetal pain is acknowledged, America has a problem: its easy conscience about 1.6 million abortions a year depends on the supposition that such pain is impossible.

Magda Denes, in her book, "In Necessity and Sorrow: Life and Death in an Abortion Hospital," brought to her subject not anti-abortion convictions but a reporter's eye for concrete detail. Examining the body of an aborted child, she described the face as showing "the agonized tautness of one forced to die too soon." That is a description to bear in mind this day, as many thousands of abortions occur.

The Washington Post
February 11, 1984

More Testimony on the Pain of the Unborn

In his Jan. 30 speech to religious broadcasters, President Reagan said, "Medical science doctors confirm that when the lives of the unborn are snuffed out [by abortion], they often feel pain, pain that is long and agonizing." This remark provoked sharp comments by columnists Judy Mann ("outright demagoguery"), Edwin M. Yoder Jr. ("appalling"), and Ellen Goodman ("a 'fact' culled from an anti-abortion journal").

These columnists apparently accepted without question the statement of a spokesman for the American College of Obstetricians and Gynecologists (ACOG) that he was "unaware of any evidence . . . that pain is perceived by a fetus."

Since ACOG's current leadership is strongly pro-abortion, its objectivity on this matter might be questioned. But Prof. Richard T. F. Schmidt, 1977-78 ACOG president, defended the president's statement, saying, "It can be clearly demonstrated that fetuses seek to evade certain stimuli in a manner which in an infant or an adult would be interpreted as reaction to pain."

Dr. Vincent J. Collins, professor of anesthesiology at the University of Illinois Medical Center and a recognized expert on human pain, recently submitted a detailed affidavit to the U.S. District Court for Northern Illinois, in which he concluded: "[A] fetus is sensitive to noxious stimuli at least by 13½ weeks, if not by eight to ten weeks. Abortions such as D&E [dilatation and evacuation, a dismemberment procedure used in the second trimester] and saline instillation, if done after 13½ weeks, will certainly cause organic fetal pain." Other medical experts submitted affidavits that supported Prof. Collins' statement.

Dr. Denis Cavanagh, professor of obstetrics and gynecology at the University of South Florida, recently testified before a committee of the Florida legislature on a series of Swedish experiments performed on unborn children aged 12 to 24 weeks: "During these experiments, electrodes were introduced into the mother's uterus, with the violent response of the fetus to the pain photographed through a fetoscope. Thus, there is no question that the fetus feels pain, and [Swedish researcher] Westin has recorded this on film."

At least 150,000 abortions are performed after 13 weeks' gestation annually in the United States. These second-trimester abortions are performed with the brutal dismemberment or salt-poisoning procedures mentioned by Prof. Collins. It requires considerable intellectual dishonesty to ignore the body of evidence which suggests that these violent procedures cause the unborn child agonizing pain—just as the president said.

—*Douglas Johnson*

The writer is legislative director for the National Right to Life Committee, Inc.

Charges disputed

MD group claims that fetuses suffer pain

A coalition of physicians has rallied behind President Reagan, supporting his contention that aborted fetuses suffer "long and agonizing pain."

"A fetus shows the precise behavior as you or I in avoiding pain. It is not a reflex, but an actual aversion to a needle or chemicals. He squirms away from any noxious influence," said spokesman Vincent Collins, MD, professor of anesthesiology at Northwestern U. in Chicago, at a Washington, D.C., press conference.

The physicians delivered a letter to Reagan, saying that "we are pleased to associate ourselves with you in drawing the attention of people across the nation to the humanity and sensitivity of the human unborn. You stand on firmly established ground." Signatories include Richard T. F. Schmidt, MD, and Fred Hofmeister, MD, both former presidents of the American College of Obstetricians and Gynecologists (ACOG), and 24 other physicians.

The medical community has ignored fetal pain because "doctors don't want to dwell on it," Dr. Collins said. "They are afraid that women who have had abortions will develop guilt reactions."

In a Jan. 31 address to the National Religious Broadcasters convention, Reagan contended that "medical science doctors confirm that when the lives of the unborn are snuffed out, they often feel pain — pain that is long and agonizing."

This was challenged by Ervin E. Nichols, MD, ACOG director of practice activities, who said he was unaware of any evidence that pain is perceived by a fetus. Dr. Nichols said a fetus may have "demonstrated neurological reflexes," but that this should not be interpreted as pain.

The coalition of physicians said they were "astounded" by Dr. Nichols' comments. In response, they convened the "educational" press conference, as a way of "getting the truth out on the table." The press conference was sponsored by the anti-abortion group Value of Life Inc. of Brighton, Mass.

THE DISPUTE remains unsettled. Dr. Nichols has performed a National Institutes of Health literature search, and still contends that there is no legitimate scientific evidence showing that fetuses feel pain early in pregnancy.

In fact, scientific literature suggests just the opposite, he says: The fetal spinal cord is not adequtely covered until the fifth month of pregnancy, and the fetal cerebellum is not sufficiently developed until the seventh month of pregnancy. A sensation of pain is dependent upon these two processes, he says.

Physicians know that fetuses feel pain, Dr. Collins counters, because:

- The cortex is developed between four and five weeks of age.
- Reflex actions can be observed between four and six weeks of age.
- Brain waves are detectable between six and seven weeks.
- Nerves connecting the spinal cord to peripheral structures have developed between six to eight weeks.
- Adverse reactions to stimuli are observed between eight and 10 weeks.
- Neurotransmitters capable of sending pain signals to the brain are present at 12 weeks.
- Opiate receptors, designed to provide analgesia, can be seen at 12 weeks.

"YOU CAN TELL by the contours on their faces that aborted fetuses feel pain," added obstetrician Matthew Bulfin, MD, of Lauderdale by the Sea, Fla. He described the case of a 25-year-old woman administered a prostaglandin abortion, who expelled her fetus in the middle of the night. Before hospital nurses could arrive to assist, she witnessed "the thrashing around and gruesome trauma on his face, and knew that the fetus had suffered."

Saline abortions cause the fetus to feel "the same agony as an adult who has suffered burns over 80% to 90% of his body," Dr. Collins said. The fetus "squirms, throws himself around, and shows a total grimacing patterns of withdrawal," he said.

Pain is most probable during second-trimester abortions, which account for 100,000 procedures a year. Pain during the first trimester is "documented with more difficulty," they said.

Local anesthesia to the mother does not ease fetal pain, Dr. Collins said. He rejected the suggestion that anesthesiologists should play a more major role in the abortion setting, saying, "We don't have enough anesthesiologists to take care of real medical problems. Most anesthesiologists I know would shun any involvement in non-productive, non-curative medicine."

What I saw at the ABORTION

by Richard Selzer

The doctor observed, the man saw

I am a surgeon. Particularities of sick flesh is everyday news. Escaping blood, all the outpourings of disease—phlegm, pus, vomitus, even those occult meaty tumors that terrify—I see as blood, disease, phlegm, and so on. I touch them to destroy them. But I do not make symbols of them.

What I am saying is that I have seen and I am used to seeing. We are talking about a man who has a trade, who has practiced it long enough to see no news in any of it. Picture this man, then. A professional. In his forties. Three children. Lives in a university town—so, necessarily, well—enlightened? Enough, anyhow. Successful in his work, yes. No overriding religious posture. Nothing special, then, your routine fellow, trying to do his work and doing it well enough. Picture him, this professional, a sort of scientist, if you please, in possession of the standard admirable opinions, positions, convictions, and so on—on this and that matter—on *abortion*, for example.

All right.

Now listen.

It is the western wing of the fourth floor of a great university hospital. I am present because I asked to be present. I wanted to see what I had never seen. An abortion.

The patient is Jamaican. She lies on the table in that state of notable submissiveness I have always seen in patients. Now and then she smiles at one of the nurses as though acknowledging a secret.

A nurse draws down the sheet, lays bare the abdomen. The belly mounds gently in the twenty-fourth week of pregnancy. The chief surgeon paints it with a sponge soaked in red antiseptic. He does this three times, each time a fresh sponge. He covers the area with a sterile sheet, an aperture in its center. He is a kindly man who teaches as he works, who pauses to reassure the woman.

He begins.

A little pinprick, he says to the woman.

He inserts the point of a tiny needle at the midline of the lower portion of her abdomen, on the downslope. He infiltrates local anesthetic into the skin, where it forms a small white bubble.

The woman grimaces.

That is all you will feel, the doctor says. Except for a little pressure. But no more pain.

She smiles again. She seems to relax. She settles comfortably on the table. The worst is over.

The doctor selects a three-and-one-half-inch needle bearing a central stylet. He places the point at the site of the previous injection. He aims it straight up and down, perpendicular. Next he takes hold of her abdomen with his left hand, palming the womb, steadying it. He thrusts with his right hand. The needle sinks into the abdominal wall.

Oh, says the woman quietly.

But I guess it is not pain that she feels. It is more a recognition that the deed is being done.

Another thrust and he has speared the uterus.

We are in, he says.

He has felt the muscular wall of the organ gripping the shaft of his needle. A further slight pressure on the needle advances it a bit more. He takes his left hand from the woman's abdomen. He retracts the filament of the stylet from the barrel of the needle. A small geyser of pale yellow fluid erupts.

We are in the right place, says the doctor. Are you feeling any pain? he says.

She smiles, shakes her head. She gazes at the ceiling.

In the room we are six: two physicians, two nurses, the patient, and me.

The participants are busy, very attentive. I am not at all busy—but I am no less attentive. I want to see.

I see something!

It is unexpected, utterly unexpected, like a disturbance in the earth, a tumultuous jarring. I see something other than what I expected here. I see a movement—a small one. But I have seen it.

And then I see it again. And now I see that it is the hub of the needle in the woman's belly that has jerked. First to one side. Then to the other side. Once more it wobbles, is *tugged*, like a fishing line nibbled by a sunfish.

Again! And I *know*!

It is the *fetus* that worries thus. It is the fetus struggling against the needle. Struggling? How can that be? I think: *that cannot be*. I think: the fetus

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Richard Selzer, a surgeon attached to Yale University, is a contributing editor. His Esquire series of essays on the body was honored last year by the Columbia University Graduate School of Journalism.

feels no pain, cannot feel fear, has no *motivation*. It is merely reflex.

I point to the needle.

It is a reflex, says the doctor.

By the end of the fifth month, the fetus weighs about one pound, is about twelve inches long. Hair is on the head. There are eyebrows, eyelashes. Pale pink nipples show on the chest. Nails are present, at the fingertips, at the toes.

At the beginning of the sixth month, the fetus can cry, can suck, can make a fist. He kicks, he punches. The mother can feel this, can *see* this. His eyelids, until now closed, can open. He may look up, down, sideways. His grip is very strong. He could support his weight by holding with one hand.

A reflex, the doctor says.

I hear him. But I saw something. I saw *something* in that mass of cells *understand* that it must bob and butt. And I see it again! I have an impulse to shove to the table—it is just a step—seize that needle, pull it out.

We are not six, I think. I think we are *seven*.

Something strangles *there*. An effort, its effort, binds me to it.

I do not shove to the table. I take no little step. It would be . . . well, madness. Everyone here wants the needle where it is. Six do. No, *five* do.

I close my eyes. I see the inside of the uterus. It is bathed in ruby gloom. I see the creature curled upon itself. Its knees are flexed. Its head is bent upon its chest. It is in fluid and gently rocks to the rhythm of the distant heartbeat.

It resembles . . . a sleeping infant.

Its place is entered by something. It is sudden. A point coming. A needle!

A spike of *daylight* pierces the chamber. Now the light is extinguished. The needle comes closer in the pool. The point grazes the thigh, and I stir. Perhaps I wake from dozing. The light is there again. I twist and straighten. My arms and legs *push*. My hand finds the shaft—grabs! I *grab*. I bend the needle this way and that. The point probes, touches on my belly. My mouth opens. Could I cry out? All is a commotion and a churning. There is a presence in the pool. An activity! The pool colors, reddens, darkens.

I open my eyes to see the doctor feeding a small plastic tube through the barrel of the needle into the uterus. Drops of pink fluid overrun the rim and spill onto the sheet. He withdraws the needle from around the plastic tubing. Now only the little tube protrudes from the woman's body. A nurse hands the physician a syringe loaded with a colorless liquid. He attaches it to the end of the tubing and injects it.

Prostaglandin, he says.

Ah, well, prostaglandin—a substance found normally in the body. When given in concentrated dosage, it throws the uterus into vigorous contraction. In eight to twelve hours, the woman will expel the fetus.

The doctor detaches the syringe but does not remove the tubing.

In case we must do it over, he says.

He takes away the sheet. He places gauze pads over the tubing. Over all this he applies adhesive tape.

I know. We cannot feed the great numbers. There is no more room. I know, I know. It is woman's right to refuse the risk, to decline the pain of childbirth. And an unwanted child is a very great burden. An unwanted child is a burden to himself. I know.

And yet . . . there is the flick of that needle. I *saw* it. I saw . . . I *felt*—in that room, a pace away, life prodded, life fending off. I saw life avulsed—swept by flood, blackening—then *out*.

There, says the doctor. It's all over. It wasn't too bad, was it? he says to the woman.

She smiles. It is all over. Oh, yes.

And who would care to imagine that from a moist and dark commencement six months before there would ripen the cluster and globule, the sprout and pouch of man?

And who would care to imagine that trapped within the laked pearl and a dowry of yolk would lie the earliest stuff of dream and memory?

It is a persona carried here as well as person, I think. I think it is a signed piece, engraved with a hieroglyph of human genes.

I did not think this until I saw. The flick. The fending off.

We leave the room, the three of us, the doctors.

"Routine procedure," the chief surgeon says.

"All right," I say.

"Scrub nurse says first time you've seen one, Dick. First look at a purge," the surgeon says.

"That's right," I say. "First look."

"Oh, well," he says, "I guess you've seen everything else."

"Pretty much," I say.

"I'm not prying, Doctor," he says, "but was there something on your mind? I'd be delighted to field any questions. . . ."

> ...There is the flick
> of that needle. I saw it...
> in that room, a pace away,
> life prodded,
> life fending off.

"No," I say. "No, thanks. Just simple curiosity."

"Okay," he says, and we all shake hands, scrub, change, and go to our calls.

I know, I know. The thing is normally done at sixteen weeks. Well, I've since seen it performed at that stage, too. And seen . . . the flick. But I also know that in the sovereign state of my residence it is hospital policy to warrant the procedure at twenty-four weeks. And that in the great state that is adjacent, policy is enlarged to twenty-eight weeks.

Does this sound like argument? I hope not. I am not trying to argue. I am only saying I've *seen*. The flick. Whatever else may be said in abortion's defense, the vision of that other defense will not vanish from my eyes.

What I saw I saw as that: a *defense*, a motion *from*, an effort *away*. And it has happened that you cannot reason with me now. For what can language do against the truth of what I saw? ⧻

"The Silent Scream"

Documenting Abortion from the Victim's Perspective

Richard D. Glasow, Ph.D.

Criticism of "The Silent Scream" Falls Apart Under Scrutiny

Since the dramatic nationwide unveiling of the film The Silent Scream in January, 1985, pro-abortion critics have attacked the authenticity of the presentation and the credibility of the narrator, Dr. Bernard Nathanson. The detailed rebuttal of the pro-abortion critiques in this booklet demonstrates that, without exception, the criticisms of the anti-life forces are a tempest in a teapot; they sound impressive until one examines the charges point by point.

The Central Message of the Film

The publicity and criticism surrounding The Silent Scream should not deflect the viewer's attention from the film's central and compelling message. As Dr. Nathanson wrote to the "CBS Morning News," "there are only four short questions of quintessential interest here:

"Is this a realtime ultrasound film?

"Is this a human unborn child on the screen?

"Is this a realtime ultrasound record of an abortion of a human unborn child?

"At the conclusion of the film, has the life of the child been obliterated, the body having been torn from the head and the head crushed and removed in pieces?

"Even our 'neutral' experts will agree," he continued, "—albeit grudgingly—that the answer to these questions is yes."

Facts About the Narrator

Bernard N. Nathanson, M.D., is one of the foremost authorities on abortion. A co-founder of the National Abortion Rights Action League, he formerly headed the largest abortion facility in the non-Communist world where he supervised the performance of nearly 60,000 abortions and personally performed over 5,000.[1]

Photo courtesy of the Washington Times

Shifting the Focus of the Abortion Debate

Since the premiere of **The Silent Scream** the focus of the abortion debate has shifted into the realm of "high-tech" to show that abortion has two victims—the woman with the unwanted pregnancy and her unborn child who can be seen through ultrasound.

In a recent interview, Dr. Nathanson eloquently summarized the larger message of **The Silent Scream** in this way. While the issue of fetal pain is "interesting" and has dominated discussion of the movie, he said, "the film has a larger message. What we are witnessing here, for the first time, is the systematic, cold-blooded destruction of a human being.

"The film begins with an intact, healthy, human unborn child, and it ends with the child's limbs torn from its body, its body from its head, and the head floating around in the uterus, at the mercy of the abortionist's crushing instrument.

"Now that kind of act—the act which we witnessed before our eyes on that screen—is not, in my estimation, an act compatible with the declared moral certitudes of any civilized human society."

The Categories of Criticisms

There have been three general categories of criticisms. First, spokesmen for the Planned Parenthood

Federation of America (PPFA) and the National Organization for Women denounce Dr. Nathanson's description of the human characteristics of the unborn child being aborted. Second, they attempt to discredit the technical aspects of the film such as the ultrasound images or the methods of abortion presented. And third, the pro-abortion groups assail—sometimes viciously—Dr. Nathanson personally and his assessment of how the abortion industry misleads and mistreats women who have abortions.[2]

This booklet first answers the criticisms about the human characteristics of the unborn baby and technical aspects of the film, and then replies to the more polemical and personal attacks by the pro-abortion groups.

Does a fetus experience pain and react to avoid it?

Criticism No. 1: The film is misleading because the cortex of the fetus is not sufficiently developed for the fetus to feel pain.

Answer: A twelve-week-old unborn baby has developed the body parts required to experience pain. Moreover, the cortex is not needed to sense pain. Professor Daniel N. Robinson, a neuropsychologist at Georgetown University and an internationally known expert on brain function, stated in congressional testimony that "none of [illegible] regions now known to be implicated in the initiation, propagation, or control of pain-signals includes the cerebral cortex."

All of the nerves, spinal cord, and thalamus sufficient to experience pain are developed in the twelve-week-old unborn baby. The nerves coming from the skin bring the pain impulse to the spinal cord, which then caries the impulse to the thalamus.

It is the thalamus of the brain "where sensations like heat, cold, pain and touch first become conscious" according to an article in *TIME* in June 1984 on "Why Pain Hurts: Unlocking An Agonizing Mystery." In this regard, the authoritative *Textbook of Medical Physiology* by Professor Arthur C. Guyton states that "it is believed that pain impulses entering only the thalamus and other lower centers [of the brain] cause at least some conscious perception of pain."[3]

The cortex is not needed to experience pain; moreover, a fully developed cortex is not absolutely necessary for normal human activity. Professor Robinson pointed out on the "CBS Morning News" that the critic's assertion "that it's the cortex that's important and that makes us human is refuted by the fact that children born with highly diminished cerebral hemispheres [in the brain] and who develop with relatively little cerebral mass. . . can develop quite normally and even exceptionally."[4]

Abortionists do not anesthetize the unborn baby during the abortion, and the pro-abortion movement opposes legislation requiring its use.[5]

Criticism No. 2: Planned Parenthood claims that the twelve-week-old fetus is not capable of making "purposeful" movements. "At this stage of pregnancy, all fetal movement is reflexive in nature rather than purposeful . . .".

Answer: The unborn baby's behavior during the abortion demonstrated that she was reacting to avoid the painful stimulus. This type of reaction to pain is at least initially reflexive in all human beings, regardless of age. As Professor Robinson observed on "CBS Morning News", "the traditional response to pain is a reflexive response whether it's a 12-week-old fetus or an adult."[6]

Since the fetus cannot talk to us, we must observe her behavior in order to judge whether she is in pain. During the film, the unborn baby exhibited behavior characteristic of being in distress by moving away from the abortion instrument and having an accelerated heartbeat. **Just as in an adult**, these motions to get away originate at the spinal-cord level and **not** in the cortex of the brain. On this point, Dr. Micheline Mathews-Roth of the Harvard Medical School observed on "CBS Morning News" that "the connections are there from the skin to the spinal cord, and up to the thalamus and up to the brain to say 'I moved. I hurt.'" She noted that the cortex, when fully developed, provides an additional function: " . . . to allow someone to make an intelligent decision about pain."[7]

What Dr. Nathanson actually says in the film is that the fetus moves in "a much more purposeful manner" once he or she senses the "aggression in its sanctuary" by the suction tip of the abortion instrument. In an interview in *USA Today*, Dr. Nathanson pointed out that all human beings under attack demonstrate an accelerated heart beat and a reflex reaction to seek escape.[8]

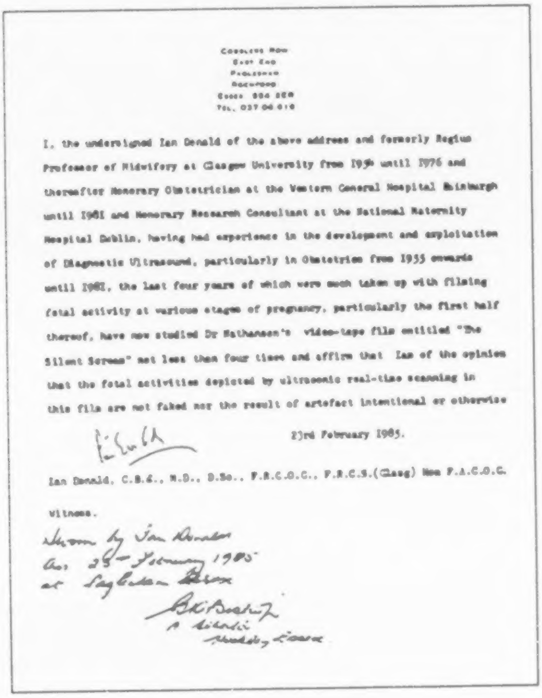
Criticism No. 3: A scream cannot occur without air in the lungs; moreover, the viewer cannot be sure that what is identified as the baby's mouth is not some other part of the baby's anatomy.

Answer: Even Dr. John Hobbins, a critic of the film, acknowledged on "CBS Morning News" that the **mouth of the unborn child was visible**.[9] Dr. Ian Donald, Professor of Obstetrics at the University of Glasgow and an internationally known researcher and inventor of ultrasound technology, also has testified to the accuracy of the ultrasound. (See sworn statement on next page.)

In addition, a twelve-week-old fetus "is capable of respiratory movement," says the authoritative textbook, *Williams Obstetrics*, "sufficiently intense to move amniotic fluid in and out of the respiratory tract."[10]

Also, Dr. Alfred W. Liley, one of the world's most eminent authorities on fetology, reported in congressional testimony a decade ago a remarkable incident where an unborn baby (probably second- or early third-trimester in age) was surrounded by air and "the presence of a substantial volume of intraamniotic air led to prolonged loud foetal crying."[11]

A useful analogy is that of a child underwater drowning in a lake or swimming pool and the unborn child in this film uttering a silent scream when her life is threatened. In neither case would their cries be heard because there is no air to carry the sound.



I, the undersigned Ian Donald of the above address and formerly Regius Professor of Midwifery at Glasgow University from 1954 until 1976 and thereafter Honorary Obstetrician at the Western General Hospital Edinburgh until 1981 and Honorary Research Consultant at the National Maternity Hospital Dublin, having had experience in the development and exploitation of Diagnostic Ultrasound, particularly in Obstetrics from 1955 onwards until 1981, the last four years of which were much taken up with filming fetal activity at various stages of pregnancy, particularly the first half thereof, have now studied Dr Nathanson's video-tape film entitled "The Silent Scream" not less than four times and affirm that I am of the opinion that the fetal activities depicted by ultrasonic real-time scanning in this film are not faked nor the result of artefact intentional or otherwise

23rd February 1985.

Ian Donald, C.B.E., M.D., D.Sc., F.R.C.O.G., F.R.C.S.(Glasg) Hon F.A.C.O.G.

Witness.

Sworn by Ian Donald
on 23rd February 1985
at [illegible]

How human is a twelve-week-old fetus?

Criticism No. 4: Contrary to Dr. Nathanson's statement in the film, the fetal heart rate does not change from 140 to 200 beats per minute during the abortion. Even if it had, a heart rate of 200 beats per minute is normal for a fetus of this age.

Answer: The first part of this criticism is simply a flat statement of error. **The film undeniably shows a pronounced rise in the fetal heart rate as the unborn child faces death.** A fetal heart beat of 200 is abnormal at any state of gestation.

According to the authoritative textbook, *Williams Obstretrics*, "[n]ormally, the fetal heart rate ranges from 120-160 beats a minute." Moreover, scientific instruments "can be used to detect fetal heart action as early as 48 days after the first day of the last normal menses."[12]

Criticism No. 5: Genuine brain waves do not occur in the fetus until the third trimester.

Answer: **Brain waves of unborn babies have been recorded on scientific instruments as early as 40 days after fertilization.**[13] The use of the word "genuine" is a smokescreen. Brain waves either exist or they don't. At the other end of the spectrum of human life, when we discuss brain waves in the elderly, the issue of "genuine" brain waves never arises.

Criticism No. 6: The fetus shown is older than twelve-weeks' gestation, probably about 14 weeks.

Answer: Perhaps the most dishonest criticism was the allegation that the baby was older than twelve weeks. **The "father of ultrasound," Dr. Ian Donald, testified to the accuracy of the entire ultrasound.** An independent expert in ultrasound measured the size of the baby's head using calibration markings on the screen and confirmed that the baby was twelve-weeks-old. Moreover, even two critics of the film on "CBS Morning News," such as Dr. Hobbins and Jennifer Niebyl, did not dispute that the fetus was twelve-weeks old.[14]

Viewers of the videotape from Planned Parenthood of Seattle-King County may become confused by the comments about the weeks of pregnancy. Dr. Nathanson's description of the abortion as being at twelve weeks is entirely consistent with terminology used by both the medical community and the general public. A critic of the film in the videotape from PP of Seattle acknowledged that physicians and the general public usually talk about the length of pregnancy in terms of the number of weeks since the mother's last menstrual period (menstrual weeks). The abortion shown in this film took place at twelve menstrual weeks when the unborn baby was ten weeks old (measured from the time of conception).

Criticism No. 7: It is inappropriate for Dr. Nathanson to refer to the fetus as an unborn child, indistinguishable from the rest of us.

Answer: **The unborn child is clearly a human being who should be accorded civil rights, especially the right to life.** A pregnant woman consistently refers to her "fetus" as an unborn baby. "Fetus" is a medical term used to describe the unborn child during a certain period of development in the womb, and pro-abortion advocates use the term in an attempt to depersonalize the child whose life is threatened by abortion.

As Dr. Nathanson points out in the film, the unborn twelve-week-old baby "has had brain waves for at least 6 weeks, his heart has been functioning for perhaps 8 weeks, and all of the rest of his functions are indistinguishable from any of ours."

In addition, fingerprints are formed by eight weeks and will never change except for size. By the ninth and tenth weeks, the baby sucks his thumb, turns somersaults, jumps, can squint, swallow and move his tongue. The sex hormones are already present, and 95% of the known structures, features and organs, from tiny nerves to fingers and muscles, are in place. The thyroid and adrenal glands are functioning.[15]

Ultrasound Photo courtesty of Stanford University School of Medicine

Was the Ultrasound Scan of the Abortion Accurate?

Criticism No. 8: The ultrasound images were manipulated, i.e., they were speeded up and magnified. Moreover, there were two types of ultrasound used in the film and the type used in the abortion was much harder to see.

Answer: The ultrasound images were not manipulated. Dr. Nathanson clearly explained to the viewer the operation of ultrasound equipment and how it was being used.

Early in the film, Dr. Nathanson demonstrated the operation of ultrasound technology including the two types of scanning methods—one suitable for early pregnancies (sector scan) and the other for late pregnancies (linear scan). The ultrasound images of the unborn child early in the film were slowed only to allow a more careful study of the child and demonstrate how the technology works.

For the abortion sequence, the ultrasound images used sector scan, were shown at normal speed, and were stopped in freeze frame to illustrate a point. **At no time were they speeded up.** Dr. E. Michael Linzey, associate professor of obstetrics and gynecology in the Division of Maternal-Fetal Medicine at the University of California, Irvine, has written that 'The Silent Scream' is an accurate representation of what takes place during a twelve-week abortion . . . . The activity of the fetus is not exaggerated movement of the ultrasound transducer but is an accurate representation of what goes on during an abortion . . . "[16]

Dr. Nathanson arranged to have the ultrasound image (which is normally recorded on a 4-inch screen) put on a 21-inch television screen so that the viewers could see what was happening. As any television viewer can appreciate, the image of the baby was naturally larger than lifesize with no deceit intended.

Criticism No. 9: An abortion at twelve weeks does not require the use of either general anesthesia for the woman or "crushing instruments" by the abortionist for the extraction of the head.

Answer: Authoritative pro-abortion spokesmen agree with Dr. Nathanson that both general anesthesia and "crushing instruments" are widely used in abortions for twelve-week-old unborn babies.

Dr. Warren Hern, a practicing abortionist and author of an authoritative 1984 book on performing abortions, writes that forceps are used during eleven- and twelve-week abortions "to determine whether any significant amount of tissue remains." Forceps are required to crush and extract the head in eleven-and twelve-week abortions since the head is too large to be pulled out through the dilated cervix by the suction cannula (tube). According to Dr. Hern, (who conducted an extensive series of measurements of head and leg sizes of aborted babies), the head of a 12-week-old unborn baby measures between 17 and 21 millimeters in diameter, with an average diameter of 18 millimeters (almost three-quarters of an inch).[17]

This crushing is necessary because the cervix is not dilated more than 10 millimeters for a twelve-week abortion. Further dilation increases the "likelihood of perforation or permanent damage to the cervix," according to a chapter on first-trimester abortion practice by Kaunitz and Grimes in a new book co-edited by Louise Tyrer, medical director of PPFA.[18]

Dr. Nathanson was also completely accurate in his description of the use of general anesthesia during the twelve-week abortion. Kaunitz and Grimes report that "local and general anesthesia are both commonly used for first-trimester abortions in the United States." Moreover, a survey conducted in 1981 by the National

Abortion Federation (the trade association of the abortion industry) showed that general anesthesia was widely used by a large number of abortion providers in first-trimester abortions.[19]

Dr. Nathanson is one of the foremost authorities on abortion. He formerly headed the largest abortion facility in the non-Communist world where he supervised the performance of nearly 60,000 abortions and personally performed over 5,000.

Criticism No. 10: The abortion in the film takes longer than usual. PPFA said that "an uncomplicated first-trimester abortion usually takes less than ten minutes to perform."

Answer: The abortion in the film required no more time than usual and actually took less than seven minutes. The remainder of the twenty-eight-minute film is comprised of explanations of the ultrasound technique, fetology, abortion procedures, and the adverse impact of legalized abortion on women and on American society.

Criticism No. 11: The fetal model that Dr. Nathanson uses during the abortion is larger than a fetus of twelve-weeks' gestation.

Answer: Dr. Nathanson twice demonstrated the relative size of the twelve-week-old fetus and then used a larger model as a prop during the abortion to illustrate the relative orientation of the child in the womb.

During the early parts of the film, Dr. Nathanson utilized a model of a twelve-week-old unborn child when he described fetal growth and demonstrated how the abortion instruments are used.

Later during the ultrasound of the abortion, he used the larger model as a prop to illustrate the relative orientation of the child in the womb and how the abortion suction cannula was cutting the child apart.

In the videotape from Planned Parenthood of Seattle-King County, two of the "medical experts" disagree about the size of the model that Dr. Nathanson is using.

Does Dr. Nathanson Present the Evidence Fairly?

Criticism No. 12: The photographs of the fetuses in the disposal containers that are flashed on the screen in the movie are actually stillborn (since they are so large) and not the result of abortion.

Answer: The photographs are of babies who died through abortion. They are of a "find" of 16,500 aborted fetuses in Los Angeles in 1982.[20]

There are over 15,000 abortions of babies of this size done every year, according to the Alan Guttmacher Institute, the research arm of Planned Parenthood. The statistics they collect show that 1% of the 1,600,000 abortions done annually in the United States are on babies over 21-weeks old. A feature news article in the *Philadelphia Inquirer* Sunday magazine in August 1981 reported that at least 500 of these aborted babies are born alive every year. A few babies have survived, but most are left to die after the abortion.[21]

Photo of 10-Week Developing Child Courtesy Origin Films

Criticism No. 13: Dr. Nathanson's estimate of the 100,000 illegal abortions in 1963 is too small. PPFA states that "Dr. Christopher Tietze . . . estimated that in 1963 the *numbers ranged between 200,000 and 1,200,000.* It is generally believed that the figure was closer to the higher level . . . ."

Answer: The U.S. Senate Committee on the Judiciary reported in 1983 after extensive study that the legalization of abortion has caused a dramatic increase in the number of abortions done every year from about 100,000 in 1963 to over 1.6 million twenty years later.[22]

PPFA misrepresented what Tietze said about the number of illegal abortions. The Senate Committee report pointed out that a study from a PPFA conference published in 1958 "estimated that the number of illegal abortions 'could be as low as 200,000 and as high as 1,200,000 a year,' adding that 'there is no objective basis for the selection of a particular figure between these two estimates as an approximation of the actual frequency.' In 1969, Dr. Christopher Tietze of The Population Council reported that 'no new data on which to base a more reliable estimate have become available . . .'"[23]

The Senate committee study agreed with Dr. Nathanson's basic point that "there can be little doubt that the legalization and consequent nationwide institutionalization of abortion has resulted in a significant increase in the total number of induced abortions." The Committee cited a study in 1981 by three investigators showing that the estimates by Planned Parenthood and others of illegal abortions had "grossly exaggerated" the actual number of such abortions. Using a better mathematical model for determining the numbers, the study estimated that illegal abortions performed from 1950 through 1977 "ranged from a low of 39,000 (in 1950)," said the Senate report, "to a high of 210,000 (in 1961) with a mean of 98,000 a year." The study concluded that the legalization of abortion had increased the total number being performed, reported the Judiciary Committee, "by six-to-eleven-fold."[24]

Criticism No. 14: PPFA asked "If Dr. Nathanson is anti-abortion, how could he participate in this filming of an actual abortion procedure?" Their answer was that he is a "zealot," and "zealots will stop at nothing in their attempts to win their cause."

Answer: Dr. Nathanson was not present and did not participate in the abortion. This abortion was going to take place anyway, whether it was being filmed or not. This criticism amounts to a personal attack by the pro-abortionists to distract attention from the merits of the film.

According to a story in the *Philadelphia Inquirer*, the unidentified abortionist made ultrasound films of 20 to 25 other abortions he performed on women who were twelve-weeks pregnant or less. After reviewing this ultrasound with Dr. Nathanson, he stopped performing abortions.[25]

Criticism No. 15: Contrary to Dr. Nathanson's assertion that PPFA and other abortion providers do not obtain adequate informed consent from women prior to abortion, PPFA states that it "takes great care to advise and counsel women and their partners of the various options for managing an unwanted pregnancy."

Answer: As Dr. Nathanson pointed out, the abortion industry has conducted a "consistent conspiracy of silence of keeping women in the dark with respect to the true nature of abortion." Congressional testimony in June 1983 by Nancy Jo Mann, founder of Women Exploited By Abortion, an organization of women who have had abortions and who now recognize that it was the wrong decision, supported Dr. Nathanson's assertion. She told a House committee that "we are not told the truth until it is too late. Women are not counseled in depth and I ask, 'Why Not?' What are people (counselors) afraid of? . . . women are capable of making very intelligent decisions, but can a person truly make an intelligent decision when she is uninformed of all the aspects and possible complications . . . ."

PPFA and the other abortion profiteers refuse to show women ultrasound pictures of their unborn children because it would deter them from having the abortion. Medical researchers have discovered that a pregnant woman who views an ultrasound scan of her unborn child develops a maternal bond with the child. In the words of the authors reporting these findings, this viewing could "influence the resolution of any ambivalence toward the pregnancy itself in favor of the fetus. Ultrasound examination may thus result in fewer abortions and more desired pregnancies."[26]

Criticism No. 16: PPFA claims that Dr. Nathanson quoted from *Williams Obstetrics* which states that the fetus is amenable to intrauterine therapy and is to be considered as a "second patient." Nathanson focused, they said, ". . . only on the fetus, totally *ignoring the pregnant woman, who is the first patient* and the thrust of the attention of the text. He misconstrues Williams' statement and implies that Williams considers the fetus the primary patient—an unacceptable premise under any circumstances."

Answer: This criticism about considering the fetus as the "second patient" while ignoring the mother is ridiculous on its face for it contradicts itself.

First, PPFA asserted that Nathanson said that the fetus is the second patient (which is true), and then PPFA contradicted itself by asserting that Nathanson said that the fetus is the first patient. Nathanson was quoting Williams, and PPFA tried to read their own biases against any consideration of the unborn child into the statement.

Criticism No. 17: PPFA stated that the "film ignores the plight of the women seeking abortion and instead tries to shift the focus to the fetus."

Answer: Dr. Nathanson states in the film that "women themselves are victims just as the unborn children are."

Early in the film Dr. Nathanson pointed out how recent developments in the wonders of science have given us additional insights into the development of the unborn child, which show that a human being worthy of protection exists within the womb. He focused on the child in the womb who has been ignored in the discussion of abortion "rights."

Near the end of the film he accused the abortion industry, including Planned Parenthood, of exploiting women. "Women themselves," he said, "are victims just as the unborn children are." Women should receive more information, such as this film, for truly informed consent.

Some Additional Points:

First, three of the allegedly "neutral medical experts" who appeared on the "CBS Morning News" and who represented PPFA, performed abortions in the early 1970s at the abortion facility that Dr. Nathanson supervised—the Center for Reproductive and Sexual Health—Dr. Richard Berkowitz on the CBS show, and Drs. William Rashbaum and Ming-Neng Yeh of PPFA.

Second, PPFA's representatives may attempt to present themselves as neutral experts on the abortion issue. PPFA lobbies in Congress and state capitals in favor of unrestricted abortion and also operates the largest chain of abortion facilities in the U.S. in over 50 different locations. Forty-four PPFA affiliates performed 86,947 abortions in 1984 for an income conservatively estimated at over $17.4 million. PPFA affiliates that do not perform abortions refer clients (including minors) to abortion facilities. Moreover, every PPFA affiliate must pay dues to the national headquarters, which are pooled with other contributions to fund pro-abortion advertising and lobbying. (Sources: PPFA Annual Report 1984; PPFA bylaws; estimated income based on $200 per abortion).

Third, when dealing with the videotape from PP of Seattle-King County, it may be useful to know that the following general pro-abortion arguments are raised:

1. Allegation that abortion is less of a health risk than childbirth. (See NRL Ed. Trust Fund pamphlet "Abortion: Some Medical Facts)
2. Allegation that public opinion polls show support for abortion on demand. (See NRL Ed. Trust Fund publication "Abortion and Public Opinion in the United States" by Professor Raymond Adamek.)
3. Alleged adverse psychological consequence of not obtaining an abortion. (See NRL Ed. Trust Fund pamphlet "Abortion: Some Medical Facts")

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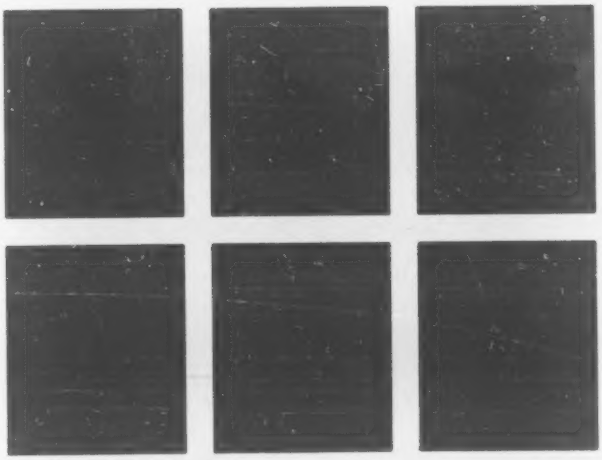

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AFFIDAVIT

American Portrait Films

RE: Movie "The Silent Scream"

Be it known that my name is E. Michael Linzey. I am an Associate Professor of Obstetrics and Gynecology at the University of California Irvine Medical Center in Orange, California. I work and am a Professor in the Division of Maternal-Fetal Medicine. I have been trained in fetal monitoring and ultrasound and in the care of the high risk pregnancy. I am familiar with embryology and all the various aspects therein. I have viewed "The Silent Scream" numerous times and have had a chance to review the accuracy of the statements made in the film as well as the reliability of the clarity of the ultrasound which is resident in the film. Regarding the film based on the preceding information, I will make the following comments:

The film, "The Slient Scream", is an accurate representation of what takes place during a twelve week abortion. At twelve weeks gestation the following organ systems are complete - every organ system. The only difference between the adult organ systems and the fetal organ systems is the size and the function which are similar to the changes that take place between the neonatal period and the adult as well. More distinctly the nervous system has the following - the three primary flexures of the brain are present, cerebral hemispheres are present and enlarging, the cerebral cortex has developed typical cells as early as eight weeks gestation. The spinal cord has attained its definitive internal structure and the brain, by four weeks gestation, has attained its general normal structural features the cord showing cervical and lumbar enlargements and neuroglial cells have been to differentiate. Therefore, this brain is complete except for enlargement and some myelinization that needs to take place in the cord. Present in the peripheral nervous system are nocioceptors which are able to pick up noxious stimuli in the fetus. Where all blood vessels travel, so travel nerves; therefore, the nervous system is out to every area of the fetal body. The fetus's features are so close to the adult that its features are distinguishably and unmistakably human. Its hands are totally formed complete. Its mouth is formed as well as its eyes and nose, ears and it moves and responds to stimuli as well as random movements.

During the film, the fetus is touched with a probing dilator and moves away in response to this as well as the suction curet. The fetus definitely moves away from the stimuli and is not a random frantic reflex as some people have stated. It certainly moves differently than a reflex movement of an amoeba!

The ultrasound and the ultrasound image produced in this film is absolutely accurate and with certainty a trained eye can observe the mouth, the eyes, the nose and the other facial features as well as the arms and legs, hands, fingers and thumbs of the infant. The activity of the fetus is not exaggerated movement of the ultrasound transducer but is an accurate representation of what goes on during an abortion both through fetal movement and through uterine wall and uterine cavity movement. What we see during this film is an abortion which in effect took only ten or fifteen minutes at the most, but because of the torture we see going on by the fetus seems to take a lot longer. It is an accurate representation of an abortion at twelve weeks gestation. It is gruesome and is most deadly in that it pulled apart the fetus after rupturing the membranes which we graphically see during the ultrasound examination. This abortion did not take any longer than average abortions take and many abortions are performed under general anesthesia or some form of general anesthetic and very few are performed with a local unless those abortions are performed earlier at 4-6-8 weeks. The abortions performed under local anesthetic that I have witnessed are most painful for the patient and sometimes result in seizure activity on the part of the patient.

In summary, I can state without equivocation that this film accurately represents a twelve week fetus with all of its identifiable human features acting in a manner in which one would expect a fetus of that gestational age to act in response to an abortion which is being observed from the candid eye of the ultrasound machine. The ultrasound was carried out in a reasonable fashion as accurately as possible without any attempt to exaggerate movement. The fetus probably feels noxious stimuli which one could interpret as pain and does open its mouth in response to this stimulus and move away.

I certify that the above statements that I have made are correct and true to the best of my knowledge and I have the experience and expertise to make these statements.

E Michael Linzey MD

Signed the 10th day of April 1985 at Orange, California by
E. Michael Linzey, M.D., Associate Professor
Department of Obstetrics & Gynecology
Division of Maternal-Fetal Medicine
University of California Irvine Medical Center

APR 15 985

MARK PATRY, M.D.
Obstétrique, Ultrason & Gynécologie
27 AVE HENDERSON STE #201
OTTAWA, ONT. K1N 7P3
Téléphone [illegible] 234-0054

FEB.27th.,1985.

Mrs. Betty Smith,
1313 Wellington street,ste #3,
Ottawa,Ont. K1Y-3B1.

Dear Mrs. Smith,

Your letter has just reached me,and I wish to thank you for it;also, I would like to follow up on the subject of the questionability of the age of the fetus shown in the film : ' Silent Scream.'

Having had ample opportunity to view the portions which were videotaped and having taken accurate measurements,I am able to forward to you the results which read as follows:

Fetal BPD:22 mm.,equivalent to 12.3 weeks of gestation.
Fetal CRL:61 mm.,equivalent to 12.51 weeks of gestation.

(CRL stands for Crown - Rump Length.)
(BPD stands for Bi - Parietal Diameter.)

These methods of assessing the fetal age are accurate to within 3-5 days of error;therefore,as a sonographer,I can vouch for the accuracy of the claim that we are indeed dealing with a 12 (twelve) week fetus.

Should that be of any utility to you, you are hereby authorised to use this letter and my name as a means of refuting any questions or arguments that are directed towards the claim that the fetus is or is not twelve weeks of age.

Respectfully,

Mark Patry

Mark Patry,MD.

Attn: Betty Green March 12, 1985

February 18, 1985

Statement from Dr. Mark Patry - Ottawa Obstetrican and Gynaecologist

Specializing in Ultrasound Consultation (and Menopause)

ON THE "SCALE" WHICH IS PRESENT ON THE OUTER EDGES OF THE SCAN IMAGE THERE ARE CALIBRATION DOTS. EACH DOT IS POSITIONED EVERY 10 mm.

THE FETAL HEAD AT 12 WEEKS BY COMPUTER PROJECTION (FROM REGRESSIVE ANALYSIS) SHOULD MEASURE 21 mm.

and at

12.3 weeks = 22 mm.

12.6 weeks = 23 mm.

12.9 weeks = 24 mm.

12 (TWELVE) weeks = 21 to 24 mm.

These statistics do apply to The Silent Scream produced by Dr. Bernard Nathanson. M.D.

Additonal and more comprehensive data will follow when Dr. Patry views the film once more - this should answer the statements made By CBOT 4 on March 11/85 when the commentator interviewed Dr. Martin Gilleson (Obstetrics in Ottawa General Hospital).

Dr. Mark Patry MD.
27 Henderson, Suite 207
Ottawa, Ontario
K1N 7P3
1-613-234-0054

Practice limited to Ultrasound Consultation in Obstetrics.

The Experience of Pain by the Unborn

John T. Noonan, Jr.

ONE ASPECT OF the abortion question which has not been adequately investigated is the pain experienced by the object of an abortion. The subject has clearly little attraction for the pro-abortion party, whose interest lies in persuading the public that the unborn are not human and even in propagating the view that they are not alive. Indeed, in a remarkable judicial opinion Judge Clement Haynsworth has written, "The Supreme Court declared the fetus in the womb is not alive . . ."[1] Judge Haynsworth's statement is merely a resolution of the oxymoron "potential life," which is the term chosen by the Supreme Court of the United States to characterize the unborn in the last two months of pregnancy.[2] Before that point, the unborn are referred to by the Court as alive only according to one "theory of life";[3] and as the phrase "potential life" appears to deny the actuality of life, Judge Haynsworth does not exaggerate in finding that, by definition of our highest court, the unborn are not alive. From this perspective, it is folly to explore the pain experienced. Does a stone feel pain? If you know as a matter of definition that the being who is aborted is not alive, you have in effect successfully bypassed any question of its suffering.

It is more difficult to say why the investigation has not been pursued in depth by those opposed to abortion. The basic reason, I believe, is the sense that the pain inflicted by an abortion is of secondary importance to the intolerable taking of life. The right to life which is fundamental to the enjoyment of every other human right has been the focus. That suffering may be experienced by those who are losing their lives has been taken for granted, but it has not been the subject of special inquiry or outrage. The assumption has been that if the killing is stopped, the pain attendant on it

---

John T. Noonan, Jr., is a professor of law at the University of California (Berkeley); this article first appeared in the book *New Perspectives on Human Abortion*, published by Aletheia Books (University Publications of America, Inc., Frederick, Maryland ©1981 by John T. Noonan, Jr.).

will stop too, and it has not seemed necessary to consider the question of pain by itself. In this respect, those opposed to abortion have been, like most medical researchers, concentrating on a cure not for the pain but for the disease.

There are good reasons, however, for looking at the question of pain by itself. We live in a society of highly developed humanitarian feeling, a society likely to respond to an appeal to empathy. To those concerned with the defense of life, it makes no difference whether the life taken is that of a person who is unconscious or drugged or drunk or in full possession of his senses; a life has been destroyed. But there are those who either will not respond to argument about killing because they regard the unborn as a kind of abstraction, or who will not look at actual photographs of the aborted because they find the fact of death too strong to contemplate, but who nonetheless might respond to evidence of pain suffered in the process of abortion. In medical research it has proved useful to isolate pain as a phenomenon distinct from disease, so it may be useful here.[4]

The Analogy of Animals

The best indication that attention to the pain of the unborn may have social consequences is afforded by the example of humanitarian activity on behalf of animals. Let me offer three cases where substantial reform was effected by concentrating on the pain the animals experienced. In each case it was accepted that animals would die, whatever reform was enacted; an appeal on their behalf could not be based on an aversion to putting animals to death. The only forceful argument was that the way in which the animals were killed was cruel because it was painful to the animals.

The first case is that of trapping animals by gins — traps that spring shut on the animal, wound it, and hold it to die over a probably protracted period. A campaign was launched in England against this method of trapping in 1928, and after thirty years Parliament responded by banning such trapping.[5] A second case is the butchering of cattle for meat. The way in which this was for centuries carried out was painful to the animal being slaughtered. A typical modern statute is the law in California which became effective only in 1968 — all cattle are to be rendered insensible by any means that is "rapid and effective" before being "cut, shackled, hoisted, thrown or cast." Or, if the animals are being slaughtered for kosher use, their consciousness must be destroyed by "the simultaneous and instantaneous severance of the carotid arteries with a sharp instrument."[6] A third case: a 1972 California statute regulates in detail the methods by which impounded dogs or cats may be killed. If carbon monoxide is used, the gas chamber must be lighted so that the animal's collapse can be monitored. A newborn dog or cat may not be killed other than by drugs, chloroform, or a decompression chamber. The use of nitrogen gas to kill an older dog or cat is regulated in terms of an oxygen reduction to be reached within sixty seconds.[7] Each of these laws has a single goal: to assure that the animal not suffer as it dies.

It may seem paradoxical, if not perverse, to defend the unborn by considering what has been done for animals. But the animal analogies are instructive on three counts: they show what can be done if empathy with suffering is awakened. They make possible an *a fortiori* case — if you will do this for an animal, why not for a child? And they exhibit a successful response to the most difficult question when the pain of a being without language is addressed — how do we know what is being experienced?

The Inference of Pain

Our normal way of knowing whether someone is in pain is for the person to use language affirming that he or she is suffering.[8] This behavior is taken as a sign, not necessarily infallible but usually accurate, that the person is in pain. By it we can not only detect the presence of pain but begin to measure its threshold, its intensity, and its tolerability. Infants, the unborn, and animals have no conceptual language in which to express their suffering and its degree.

Human infants and all animals brought up by parents will cry and scream.[9] Every human parent becomes adept at discriminating between a baby's cry of pain and a baby's cry of fatigue or of anxiety. How do we distinguish? By knowing that babies are human, by empathizing, by interpreting the context of the cry. We also proceed by trial and error: this cry will end if a pain is removed, this cry will end if the baby falls asleep. But animals, we know, are not human and are, in many significant ways, not like us. How do we interpret their cries or their wriggling as pain reactions if they are silent?

What we do with animals to be able to say that they are in pain is precisely what we do with the newborn and the infant: we empathize. We suppose for this purpose that animals are, in fact, "like us," and we interpret the context of the cry. We also proceed by trial and error, determining what stimuli need to be removed to end the animal's reaction.[10] We are not concerned with whether the animal's higher consciousness, its memory and its ability to understand cause and to forecast results, are different from our own, even though we know that for us the development of our consciousness, our memory, our understanding, and our sense of anticipation all may affect our experience of pain. With animals, we respond when we hear or see the physical sign we interpret as a symptom of distress.

Once we have made the leap that permits us to identify with animals, we do not need to dwell on the overt signs of physical distress. All we need is knowledge that an injury has been inflicted to understand that the animal will be in pain. Consider, by way of illustration, this passage on the cruelties of whaling: "A lacerated wound is inflicted with an explosive charge, and the whale, a highly sensitive mammal, then tows a 300-ton boat for a long time, a substantial fraction of an hour, by menas of a harpoon pulling in the wound."[11] The author does not particularize any behavior of the wounded whale beyond its labor tugging the whaleboat, nor does he need to. We perceive the situation and the whale's agony. In a similar way the cruelty involved in hunting seals is shown by pointing to their being shot and left to die on the ice.[12] The pain of the dying seal is left to imaginative empathy.

We are, in our arguments about animal suffering and in our social response to them, willing to generalize from our own experience of pain and our knowledge of what causes pain to us. We know that pain requires a force inflicting bodily injury and that, for the ordinary sentient being who is not drugged or hypnotized, the presence of such a force will occasion pain. When we see such a force wounding any animal we are willing to say that the animal feels pain.

The Nature of Pain

If we pursue the question more deeply, however, we meet a question of a mixed philosophical-psychological character. What is pain? Pain has in the past been identified with "an unpleasant quality in the sense of touch." Pain has also been identified with "unpleasantness," understood as "the awareness of harm."[13] In the analysis of Thomas Aquinas, *dolor* requires the deprivation of a good together with perception of the deprivation. *Dolor* is categorized as interior *dolor*, which is consequent on something being apprehended by the imagination or by reason, and exterior *dolor*, which is consequent on something being apprehended by the senses and especially by the sense of touch.[14] The Thomistic definition of exterior *dolor*, while general, is not incongruent with a modern understanding of pain, which requires both harmful action on the body and perception of the action. It has been observed that pain also has a motivational component: part of the pain response is avoidance of the cause of the pain.[15] In the words of Ronald Melznack, a modern pioneer in work on pain, "The complex sequences of behavior that characterize pain are determined by sensory, motivational, and cognitive processes that act on motor mechanisms."[16]

Pain, then, while it may be given a general definition, turns out upon investigation to consist of a series of specific responses involving different levels and kinds of activity in the human organism. Melzack has put forward a "gating theory" of pain, in which the key to these responses is the interaction between stimuli and inhibitory controls in the spinal column and in the brain which modulate the intensity and reception of the stimuli.[17] Melzack's theory requires the postulation of control centers, and it is not free from controversy.[18] Yet in main outline it persuasively explains a large number of pain phenomena in terms of stimuli and inhibitors.

To take one illustration at the level of common experience, if someone picks up a cup of hot liquid, his or her response may vary depending on whether the cup is paper or porcelain. The paper cup may be dropped to the ground; an equally hot porcelain cup may be jerkily set back on the table. What is often looked at as a simple reflex response to heat is modified by cognition.[19] To take a more gruesome experience, a number of soldiers severely wounded on the beach at Anzio told physicians in the field hospital that they felt no pain; they were overwhelmingly glad to be alive and off the beach. The same wounds inflicted on civilians would have been experienced as agonizing.[20] For a third example, childbirth without anesthesia is experienced as more or less painful depending on the cultural conditioning which surrounds it.[21]

As all of these examples suggest, both the culure and specific experiences play a part in the perception of pain. Memory, anticipation, and understanding of the cause all affect the perception. It is inferable that that brain is able to control and inhibit the pain response. In Melzack's hypothesis, the gating mechanism controlling the sensory inputs which are perceived as painful operates "at successive synapses at any level of the central nervous system in the course of filtering of the sensory input."[22] In this fundamental account, "the presence or absence of pain is determined by the balance between the sensory and the central inputs to the gate control system."[23]

What is the nature of the sensory inputs? There are a larger number of sensory fibers which are receptors and transmitters, receiving and transmitting information about pressure, temperature, and chemical changes at the skin. These transmissions have both temporal and spatial patterns. It is these patterns which will be perceived as painful at certain levels of intensity and duration when the impulses are uninhibited by any modulation from the spinal column or brain.[24]

The Experience of the Unborn

For the unborn to experience pain there must be sense receptors capable of receiving information about pressure, temperature, and cutaneous chemical change; the sense receptors must also be capable of transmitting that information to cells able to apprehend it and respond to it.

By what point do such receptors exist? To answer this question, the observation of physical development must be combined with the observation of physical behavior. As early as the 56th day of gestation the child has been observed to move in the womb.[25] In Liley's hypothesis, "the development of structure and the development of function go hand in hand. Fetal comfort determines fetal position, and fetal movement is necessary for a proper development of fetal bones and joints."[26] If fetal bones and joints are beginning to develop this early, movement is necessary to the structural growth; and if Liley is correct, the occasion of movement is discomfort or pain. Hence, there would be some pain receptors present before the end of the second month. A physiologist places about the same point — day 59 or 60 — the observation of "spinal reflexes" in the child. Tactile stimulation of the mouth produces a reflex action, and sensory receptors are present in the simple nerve endings of the mouth.[27] Somewhere between day 60 and day 77 sensitivity to touch develops in the genital and anal areas.[28] In the same period, the child begins to swallow. The rate of swallowing will vary with the sweetness of the injection.[29] By day 77 both the palms of the hands and the soles of the feet will also respond to touch; by the same day, eyelids have been observed to squint to close out light.[30]

A standard treatise on human physiological development puts between day 90 and day 120 the beginning of differentiation of "the general sense organs," described as "free nerve terminations (responding to pain, temperature, and common chemicals), lamellated corpuscles (responding to deep pressure), tactile corpuscles, neuromuscular spindles, and neurotendinous end organs (responding to light and deep pressure)."[31] But as responses to touch, pressure, and light precede this period, visible differentiation must be preceded by a period in which these "general sense organs" are functioning.

The cerebral cortex is not developed at this early stage; even at twelve to sixteen weeks it is only 30 percent to 40 percent developed.[32] It is consequently a fair conclusion that the cognitive input into any pain reaction will be low in these early months. Neither memory nor anticipation of results can be expected to affect what is experienced. The unborn at this stage will be like certain Scotch terriers, raised in isolation for experimental purposes, who had no motivational pain responses when their noses encountered lighted matches; they were unaware of noxious signals in their environment.[33] But if both sensory receptors and spinal column are involved, may one say with assurance that the reception of strong sense impressions causes no pain? It would seem clear that the reactions of the unborn to stimuli like light and pressure are the motivational responses we associate with pain. We say that a sense receptor is there because there is a response to touch and a taste receptor because there is a response to taste. By the same token we are able to say that pain receptors are present when evasive action follows the intrusion of pressure or light, or when injection of a disagreeable fluid lowers the rate of swallowing. Liley is categorical in affirming that the unborn feel pain.[34] His conclusion has recently been confirmed by an American researcher, Mortimer Rosen, who believes the unborn respond to touch, taste, and pain.[35]

While the likelihood of weak participation by the cerebral cortex will work against the magnification of the pain, there will also be an absence of the inhibitory input from the brain which modulates and balances the sensory input in more developed beings. Consequently, the possibility exists of smaller and weaker sensory inputs having the same effect which later is achieved only by larger and stronger sensations.

As the sensory apparatus continues to grow, so does the cerebral cortex: light stimuli can evoke electrical response in the cerebral cortex between the sixth and seventh months.[36] By this time there will be a substantial cerebral participation in pain perception together with the likelihood of greater brain control of the sensory input. If a child is delivered from the womb at this date, he or she may shed tears. He or she will cry.[37] As we do with other newborns, we interpret these signs in terms of their context and may find them to be signs of pain. What we conclude about the delivered child can with equal force be concluded about the child still in the womb in months six through nine: that unborn child has developed capacity for pain.

In summary, beginning with the presence of sense receptors and spinal responses, there is as much reason to believe that the unborn are capable of pain as that they are capable of sensation. The ability to feel pain grows together with the development of inhibitors capable of modulating the pain. By the sixth month, the child in the womb has a capacity for feeling and expressing pain comparable to the capacity of the same child delivered from the womb. The observation sometimes made that we don't remember prenatal pains applies with equal force to the pains of being born or the pain of early infancy. Memory, it must be supposed, suppresses much more than it recalls. If we remember nothing about life before birth or life before three or four, it may even be that some recollections are painful enough to invoke the suppressive function of our memory; life in the womb is not entirely comfortable.

The Experience of Pain in an Abortion

The principal modern means of abortion are these. In early pregnancy sharp curettage is practiced: a knife is used to kill the unborn child.[38] Alternatively, suction curettage is employed: a vacuum pump sucks up the unborn child by bits and pieces, and a knife detaches the remaining parts.[39] In the second trimester of pregnancy and later a hypertonic saline solution is injected into the amniotic fluid surrounding the fetus. The salt appears to act as a poison;[40] the skin of the affected child appears, on delivery, to have been soaked in acid.[41] Alternatively, prostaglandins are given to the mother; in sufficient dosage they will constrict the circulation and impair the cardiac functioning of the fetus.[42] The child may be delivered dead or die after delivery.[43]

Are these experiences painful? The application of a sharp knife to the skin and the destruction of vital tissue cannot but be a painful experience for any sentient creature. It lasts for about ten minutes.[44] Being subjected to a vacuum is painful, as is dismemberment by suction. The time from the creation of the vacuum to the chief destruction of the child again is about ten minutes.[45] Hypertonic saline solution causes what is described as "exquisite and severe pain" if, by accident during an abortion, it enters subcutaneously the body of the woman having the abortion.[46] It is inferable that the unborn would have an analogous experience lasting some two hours, as the saline solution takes about this long to work before the fetal heart stops.[47] The impact of prostaglandins constricting the circulation of the blood or impairing the heart must be analogous to that when these phenomena occur in born children: they are not pleasant. If, as has been known to happen, a child survives saline or prostaglandin poisoning and is born alive, the child will be functioning with diminished capacity in such vital functions as breathing and cardiac action.[48] Such impaired functioning is ordinarily experienced as painful.

Do the anesthetics the mother has received lessen the pain of the child? It is entirely possible that some drugs will cross the placenta and enter the child's system, causing drowsiness. Anesthesia, however, is not administered to the gravida with the welfare of her child in mind, nor do the anesthetics ordinarily used prevent the mother from serious pain if she is accidentally affected by the saline solution. It may be inferred the child is not protected either. Is it possible that the abortifacient agent destroys the pain receptors and the capability of a pain response earlier than it ends the life of the unborn, so that there is a period of unconsciousness in which pain is not experienced? This is possible in curettage by knife or suction, but it would seem to occur haphazardly, since stunning the child is not the conscious aim of the physician performing the abortion. In saline or prostaglandin poisoning it seems unlikely that the pain apparatus is quickly destroyed. An observation of Melzack is of particular pertinence: the local injection of hypertonic saline opens the spinal gate, he has remarked, and evokes severe pain. At the same time, it raises the level of the inhibitors and closes the gate to subsequent injections.[49] From this it may be inferred that an unborn child subjected to repeated attempts at abortion by saline solution — the baby in the *Edelin* case was such a child[50] — suffers a good deal the first time and much less on the second and third efforts. The general observation of Melzack on the mechanism of pain is also worth recalling: any lesion which impairs the tonic inhibitory influence from the brain opens the gate, with a consequent increase in pain.[51] Any method of abortion which results first in damage to the cortex may have the initial effect of increasing the pain sensations.

From the review of the methods used, we may conclude that as soon as a pain mechanism is present in the fetus — possibly as early as day 56 — the methods used will cause pain. The pain is more substantial and lasts longer the later the abortion is. It is most severe and lasts the longest when the method is saline poisoning.

Whatever the method used, the unborn are experiencing the greatest of bodily evils, the ending of their lives.[52] They are undergoing the death agony. However inarticulate, however slight their cognitive powers, however rudimentary their sensations, they are sentient creatures undergoing the disintegration of their being and the termination of their vital capabilities. That experience is painful in itself. That is why an observer like Magda Denes, looking at the body of an aborted child, can remark that the face of the child has "the agonized tautness of one forced to die too soon."[53] The agony is universal.

Conclusion

There are no laws which regulate the suffering of the aborted like those sparing pain to dying animals. There is nothing like the requirement that consciousness must be destroyed by "rapid and effective" methods as it is for cattle; nothing regulating the use of the vacuum pump the way the decompression chamber for dogs is regulated; nothing like the safeguard extended even to newborn kittens that only a humane mode of death may be employed. So absolute has been the liberty given the gravida by the Supreme Court that even the prohibition of the saline method by a state has been held to violate the Constitution.[54] The Supreme Court has acted as though it believed that its own fiat could alter reality and as if the human fetus is not alive.

Can human beings who understand what may be done for animals and what cannot be done for unborn humans want this inequality of treatment to continue? We are not bound to animals to the same degree as we are bound to human beings because we lack a common destiny, but we are bound to animals as fellow creatures, and as God loves them out of charity, so must we who are called to imitate God.[55] It is a sign not of error or weakness but of Christlike compassion to love animals. Can those who feel for the harpooned whale not be touched by the situation of the salt-soaked baby? We should not despair of urging further the consciences of those who have curtailed their convenience to spare suffering to other sentient creatures.

With keener sensibilities and more developed inhibitors than animals, we are able to empathize with their pain. By the same token, we are able to empathize with the aborted. We can comprehend what they must undergo. All of our knowledge of pain is by empathy: we do not feel another's pain directly. That is why the pain of others is so tolerable for us. But if we begin to empathize, we may begin to feel what is intolerable.

We are bound to the beings in the human womb by the common experience of pain we have also known in the womb. We are bound to them as well by a common destiny, to share eternal life. As fellow wayfarers, we are bound to try to save them from a premature departure. We can begin to save them by communicating our knowledge of the suffering they must experience.

NOTES

1. *Floyd* v. *Anders*, 440 F. Supp. 535, 539 (D.S.C. 1977).
2. *Roe* v. *Wade*, 410 U.S. 113, 162 (1973).
3. Id. at 163.
4. On the usefulness of looking at pain as a separate phenomenon, see Ronald Melzack, *The Puzzle of Pain* (New York: Basic Books, 1973), pp. 9-10.
5. C. W. Hume, *Man and Beast* (London: Universities Federation for Animal Welfare, 1962), p. 214.
6. Cal. Agric. Code § 19 (1967).
7. Cal. Penal Code §§ 597 v. and w. (1978).
8. John S. Liebeskind and Linda A. Paul, "Psychological and Physiological Mechanisms of Pain," *American Review of Psychology* 28 (1977):42.
9. As to parentally cared-for animals, see Hume, op. cit., p. 45.
10. Ibid., pp. 94-95.
11. Ibid., p. 215.
12. Ibid., pp. 215-216.
13. Edward Boring, *Pain Sensations and Reactions* (Baltimore: The Williams and Wilkins Co., 1952), pp. v-vi.
14. Thomas Aquinas, *Summa Theologica*, I-II, q. 35, art. 7.
15. Melzack, op. cit., p. 163.
16. Ibid., p. 165.
17. Ibid., pp. 158-166.
18. See Liebeskind and Paul, op. cit., p. 47.
19. Cf. Melzack, op. cit. pp. 29-31.
20. Ibid., pp. 29-30.
21. Ibid., p. 22.
22. Ibid., p. 166.
23. Ibid., p. 171.
24. Ibid., p. 158.
25. A. William Liley: "The foetus as personality," *Australia and New Zealand Journal of Psychiatry* 6:99, 1972.
26. A. William Liley, "Experiments with Uterine and Fetal Instrumentation," in *Intrauterine Fetal Visualization*, ed. Michael M. Kuback and Carlo Valenti (Oxford: Excerpta Medica; New York: American Elsevier Publishing Co., 1976), p. 75.
27. P.S. Timiras, *Developmental Physiology and Aging* (New York: The Macmillan Company, 1972), p. 153.
28. Ibid., p. 153.
29. Liley: "The foetus as personality," op. cit., p. 102.
30. Trypena Humphrey, "The Development of Human Fetal Activity and Its Relation to Postnatal Behavior," in *Advances in Child Development and Behavior*, ed. Hayne W. Reese and Lewis P. Lipsitt (New York: Academy Press, 1973), pp. 12, 19.
31. Timiras, op. cit., p. 137.

32. Geoffrey S. Dawes, *Fetal and Neonatal Physiology* (Chicago: Year Book Medical Publishers, 1968), p. 126.

33. Melzack, op. cit., p. 28.

34. Liley: Experiments with Uterine and Fetal Instrumentation, op. cit.

35. Mortimer Rosen, "The Secret Brain: Learning Before Birth," *Harper's*, April 1978, p. 46.

36. Timiras, op. cit., p. 149.

37. Paul Mussen, John Congar, and Jerome Kagan, *Child Development and Personality*, 2nd ed. (New York: Harper and Row, 1963), p. 65.

38. Louis M. Hellman and Jack A. Pritchard, eds., *Williams Obstetrics*, 14th ed. (New York: Appleton-Century-Crofts, 1971), p. 1089.

39. Selig Neubardt and Harold Schwelman, *Techniques of Abortion* (Boston: Little, Brown and Company, 1972), pp. 46-47.

40. Ibid., p. 68.

41. Magda Denes, *In Necessity and Sorrow: Life and Death in an Abortion Hospital* (New York: Basic Books, 1976), p. 27.

42. Sultan M.M. Karim, *Prostaglandins and Reproduction* (Baltimore: University Park Press, 1975), p. 107.

43. See *Floyd* v. *Anders*, 440 F. Supp. 535 (D. S.C. 1977), for a case where the child died after delivery.

44. André Hellegers, director of the Joseph and Rose Kennedy Institute, to the author, oral communication.

45. Id.

46. Neubardt and Schwelman, op. cit., p. 68.

47. Karim, op. cit., p. 107.

48. See A. I. Csapo et al.: "Termination of pregnancy with double prostaglandin input," *American Journal of Obstetrics and Gynecology* 124:1, 1976.

49. Melzack, op. cit., pp. 181-182.

50. *Commonwealth* v. *Edelin*, — Mass., 359 (N.E.2d) 4 (1976).

51. Melzack, op. cit., p. 171.

52. Thomas Aquinas, *Summa contra Gentiles* 4, 52.

53. Denes, op. cit., p. 60.

54. *Planned Parenthood* v. *Danforth*, 428 U. S. 52 (1976).

55. Thomas Aquinas, *Summa Theologica*, II-II, q. 25, art. 3, reply to objection 3.

Senator HATCH. We have in essence honored each of you for your particular skills and knowledge, and study in this area. We would certainly keep that record open for you for at least another week, and try and complete this record which I think has been very stimulating.

Thank you so much for being here. We will recess.

[Whereupon, at 12:45 p.m., the subcommittee adjourned.]

APPENDIX

FETUS, PLACENTA, AND NEWBORN

Naloxone and its possible relationship to fetal endorphin levels and fetal distress

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Davis, California, and Omaha, Nebraska

This case report of fetal asphyxia and related studies suggest that fetal endorphins play a role in fetal pain tolerance and cardiovascular asphyctic responses. Elevated fetal endorphin levels may, like narcotics, produce abnormally "flat" fetal heart rate patterns intrapartum and fetal tolerance to pain. Although naloxone hydrochloride was used with some success to return flat fetal heart rate patterns to "normal," the unopposed antagonism of fetal endorphins by naloxone in times of fetal distress may be detrimental. (AM. J. OBSTET. GYNECOL. 139:16, 1981.)

NALOXONE HYDROCHLORIDE is considered to be a pure narcotic antagonist as it does not possess the agonistic actions of morphine-like drugs. Nor does it produce respiratory depression, psychotomimetic effects, or pupillary constriction. Thus, naloxone has been considered to have no pharmacologic activity in the absence of narcotics. Reported here are cases in which intrapartum naloxone had a probable effect upon human fetal heart rate responses in the absence of prior narcotic administration, presumably because naloxone inhibits fetal endorphins.

Studies

In eight normal intrapartum fetuses at term who showed "flat" heart rate baselines (low beat-to-beat variability) for at least 30 minutes, naloxone hydrochloride, 0.4 mg, was given intramuscularly to the mothers to arouse their fetuses. Four of the eight fetuses (50%) demonstrated a normal beat-to-beat variability within 20 minutes. Three mothers requested narcotics for pain relief within 20 minutes of the naloxone injection and, therefore, were excluded from the study. The remaining fetus (12%) demonstrated a flat baseline until late in the second stage of labor.

Following saline or placebo injection in five other fetuses with flat intrapartum fetal heart rate tracings, normal beat-to-beat variability returned in only one (20%) within 20 minutes. Either fetal scalp or umbilical artery pH was above 7.22 in all fetuses.

Based on statements that the drug had no detrimental fetal or neonatal effects,[1, 2] the use of naloxone hydrochloride under these circumstances had the approval of the hospital's Committee on Human Experimentation.

Case history

S. N., a 19-year-old, para 0-0-0-0 black woman, had an uncomplicated antenatal course and was admitted in labor at term. Five hours after admission, a diagnosis of secondary arrest of labor was made when cervical dila-

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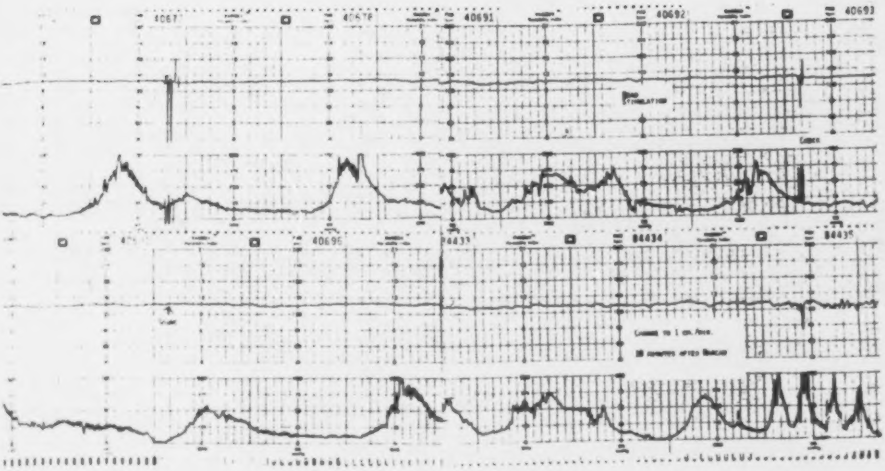

Fig. 1. Four sections of a fetal heart rate recording demonstrating loss of beat-to-beat variability. In the lower right recording, the paper speed was changed from 3 to 1 cm/min in order to better demonstrate beat-to-beat variability.

not progressed at 6 cm for 2 hours. An oxytocin infusion up to 16 mU/min was begun and the membranes were ruptured. Meconium staining of the amniotic fluid was noted, and the fetal heart rate patterns (*No. 40677*, Fig. 1) demonstrated a loss of beat-to-beat variability. An attempt to obtain a fetal scalp pH was [illegible]. Because of the heart rate pattern and meconium staining of the fluid, preparations were made for possible cesarean section and oxygen administration was begun.

As indicated in Fig. 1, attempts were then made to arouse the fetus (*No. 40691* to *No. 40696*) by tactile stimulation of the fetal vertex and by an external sound [illegible] over the vertex (100 dB, 2,000 Hz for 30 seconds). When these efforts to increase the fetal heart rate beat-to-beat variability failed, and 25 minutes after the oxytocin infusion was begun, the patient was given naloxone hydrochloride, 0.4 mg intramuscularly, to arouse the fetus. The nature and purpose of the drug had been explained to the patient. Ten minutes later, the fetal heart rate pattern was considered to show [illegible] beat-to-beat variability (*No. 84434*).

[illegible] minutes after the oxytocin infusion was begun, [illegible] was fully dilated, and the vertex was at station [illegible] the patient began to push. For the first time [illegible] were noted in the fetal heart rate pattern ([illegible] of Fig. 2). A fetal scalp pH obtained at this [illegible] 7.[illegible] and [illegible] "arterialized" venous blood [illegible] fetal heart rate pattern soon [illegible], it was assumed that the scalp pH was in error; nevertheless, the delivery was expedited. Frame *No. 84449* of Fig. 2 was obtained in the delivery room immediately prior to application of the forceps. An easy midforceps delivery was accomplished, and the 3,350 gm female infant had a 1-minute Apgar score of 2. After resuscitation, the infant's 5-minute Apgar score was 5.

In the nursery, the infant appeared to be somewhat depressed and had signs and symptoms of meconium aspiration, although no meconium had been seen below the vocal cords at the time of delivery. The infant was maintained on a respirator with high settings, but at 22 hours of age, she began to have generalized seizures. These could not be controlled and she died at 37 hours of age of apparent respiratory failure. Postmortem examination showed minimal meconium aspiration and no gross abnormalities of the brain. Death was presumed to be secondary to asphyxia in utero. The use of naloxone under these circumstances was discontinued after this case.

Comment

Hyperactive intrapartum fetal heart rate patterns may reflect increased arousal caused by fetal suffering or pain. Such fetal heart rate patterns, or even ominous patterns, may revert to normal with significant maternal systemic pain relief and/or anesthesia.[1-3] Tomor-Tritsch and associates[6] considered this apparent improvement in fetal heart rate patterns following

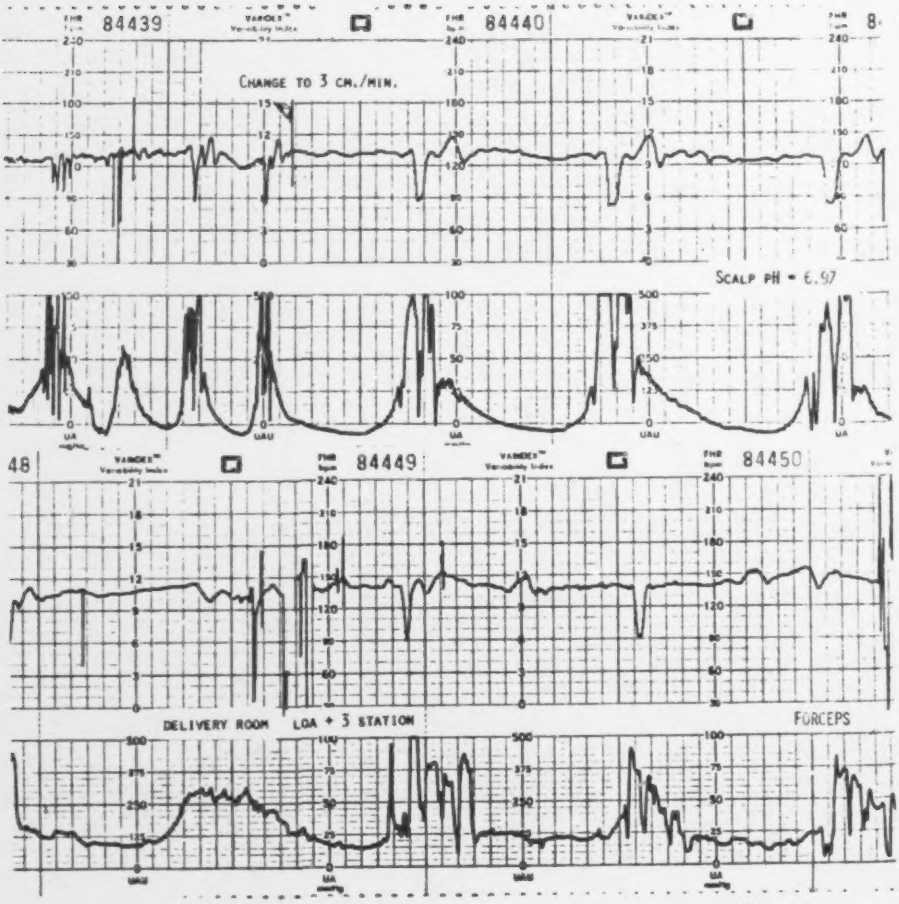

Fig. 2. Two sections of a fetal heart rate recording. In the upper section, "overshoots" are seen (paper speed changed back to 3 cm/min). Lower recording was obtained immediately prior to forceps application and was considered to demonstrate no abnormalities. Umbilical vein pH was 7.20. Artery pH was 7.07.

general anesthesia to represent decreased intensity of uterine contractions. However, another interpretation is that the well-being of the intrapartum fetus subjected to severe pain, just as in the suffering adult, is improved by analgesia.[4, 5]

Narcotics offer a small degree of fetal protection from asphyxia,[4, 5] and endogenous endorphins or other self-produced opiates may serve a like function for the stressed fetus. Gautray and associates[7] found increased endorphins in amniotic fluid during labor, especially in the case of fetal distress. Wardlaw and associates[8] observed increased plasma beta endorphin levels in fetal sheep after hypoxia and, in human fetuses, described a negative correlation between umbilical artery pH and fetal beta endorphin like immunoactivity. They concluded that hypoxia and secondary

Acidosis may be a stimulus for the release of fetal endorphins. Despite numerous studies suggesting that naloxone is without effect in the absence of prior narcotic administration,[1, 2] the possibility exists that antagonism of endorphins by naloxone may be detrimental to some distressed fetuses. In single case reports, naloxone has been associated with hypertension in adults.[9, 10]

Naloxone hydrochloride is considered to antagonize endorphins as well as narcotics. In adult humans, it has been shown that placebo-induced tolerance to chronic pain is reduced by naloxone injection.[11] This increased pain sensitivity presumably reflects naloxone antagonism of the endorphins produced in response to chronic pain. Human fetuses and their placentas have varying amounts of endorphin activity,[8, 12] which could explain their different intrapartum fetal heart rate reactivities, which may likewise be increased by naloxone. The intrapartum fetal heart rate pattern with low beat-to-beat variability (reactivity) could reflect a high fetal endorphin level, which allows the fetus to "sleep" during labor. Such fetal heart rate patterns when associated with decelerations are sometimes of medical concern and it seems reasonable to attempt to arouse the fetus to confirm its well-being. This modest success of obtaining "normal" fetal heart rate patterns after naloxone administration supports the hypothesis that elevated fetal endorphin levels contribute to fetal heart rate patterns of loss of beat-to-beat variability.

In the case of S. N., no scalp pH was obtained at the time of the initial discovery of decreased fetal heart beat-to-beat variability. None of the other fetuses with loss of beat-to-beat variability had abnormal pHs, and because our prior experience suggested that a flat fetal heart rate baseline without decelerations was not associated with acidemia, plans for vaginal delivery seemed reasonable. Zalar and Quilligan[13] similarly have found that loss of beat-to-beat variability without other fetal heart rate abnormalities is seldom associated with fetal acidemia. If one assumes that there was no acidemia in this fetus at the time of the naloxone administration and blockage of fetal endorphins, naloxone may have both enhanced fetal asphyxia and caused the appearance of "normal" fetal heart rate patterns. Obviously, given the uncertainties of this particular case report, it cannot be proved that naloxone was detrimental to this fetus for, indeed, it is not even known for certain that naloxone effectively crosses the placenta, although clinical experience suggests that it does.[14] Unrelated to these concepts, the Committee on Drugs (with the approval of the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists) has stated (1980) that naloxone is not recommended for administration to the mother just prior to delivery to reverse the fetal and neonatal effects of maternally administered narcotic analgesics.[15]

The psychiatric literature suggests that birth is a painful process for the fetus[16] and may be a source of stress. The purpose of this report is to support the concept that fetuses may endure pain during labor, that endorphins or similar self-produced opiates aid the fetus in withstanding such stress, and that agents like naloxone may be detrimental to fetal welfare through counteracting their endorphins.

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It brings an untold burden of suffering, sending more Americans in search of a cure than any other malady. The sharp edge or the dull throb of pain, whether springing from arthritis, migraine or from unknown causes, disables more people than either cancer or heart disease. Yet its origins remain largely unexplored territory. Only now are researchers responding to the need for special treatment of both mind and body when patients complain, “Doctor, it hurts.”

Medicine

COVER STORY

Unlocking Pain's Secrets

The question for doctors: How do you spell relief?

The alarm rings at 7, and she reaches for the pillbox. It is the first act of her day. Her suffering, like the box itself, is divided into four spaces, each with its allotment of pink, white, brown and blue pills. "The pain is always there," she says; "there are just different levels of it." First there is the "daily, hard, getting-around pain." This constant pain of rheumatoid arthritis has been with Maureen Hemmis, 37, since she was 18 years old. Then there is the variable pain: spots of acute, stabbing sensations that change location each day. Worst of all are the arthritic flare-ups when each joint rages and burns, hot to the touch. "The pain is everywhere. You can't be moved or touched. It's very much like being on fire."

In one way or another, we have all felt it. If it were a color, we would say it comes in a thousand shades, from vivid reds to somber browns. There is the quick, flashing smart of a finger scorched by a flame or the grinding torment of the dentist's drill striking close to a nerve. We all know the dull throb of a stubbed toe that sends us hippity-hopping from foot to foot in search of distraction. And many have felt the pain that cuts deeper: the gut-clutching agony that we awaken to after surgery.

Though familiar to us all, pain is mercifully difficult to remember once it has passed (if it were not, it has been observed, every family would have but one

▸ Blaine Anderson's migraine headaches began last September, and suddenly she found herself gripped by viselike pain. Desperate, she tried everything from codeine to psychic counseling. Relief finally came in the form of a drug developed for heart patients. ◂

“ It was like a very tight cap.
It felt like my body was under siege. ”

child). Doctors refer to the short-lived suffering of childbirth or surgery or even a toothache as "acute pain"; it is terrible at the time, but ultimately it passes. For untold millions, however, pain does not pass. It sings on through the night, month after month, overwhelming sleep, stifling pleasure, shrinking experience, until there is nothing but pain. This is chronic pain, and its sufferers are legion: there are more than 36 million arthritics in the U.S.; there are 70 million with agonizing back pain; about 20 million who suffer from blinding migraines; millions more who are racked by diseases like sciatica and gout. Most feared of all, the pain associated with cancer afflicts some 800,000 Americans and 18 million people worldwide.

All told, nearly one-third of the American population have persistent or recurrent chronic pain, according to Seattle Anesthesiologist John Bonica, founder of the International Association for the Study of Pain and a world-renowned leader in pain research. Of these, he estimates, one-half to two-thirds are partly or totally disabled for periods of days, weeks or months, or for life. "Chronic pain disables more people than cancer or heart disease," says Bonica, "and it costs the American people more money than both." His estimate: $70 billion a year in medical costs, lost working days and compensation. The human cost, of course, cannot be measured. Shingles Sufferer Mark Metcalf, 35, of Berkeley, Calif., endured weeks of pain that "felt like I had a hot iron held against the side of my neck," and he found himself "considering suicide as a rational alternative." Every year a number of the chronically suffering make that choice. Pain, said Albert Schweitzer, "is a more terrible lord of mankind than even death himself."

It is the single most common reason for seeing a doctor. It is the No. 1 reason people take medication. And yet for a variety of reasons, medical science is ill equipped to deal with pain. While the 20th century has brought remarkable advances in the treatment and in some cases the elimination of disease, doctors' understanding of pain is just beginning to emerge from the dark ages. "Pain is the weak link in modern medicine," says Dr. Josef Wang, director of the pain center at the Mayo Clinic. To begin with, medical students receive only the scantest introduction to the subject. A 1983 survey by Bonica of 17 standard textbooks on surgery, medicine and cancer found that only 54 pages out of a total of 22,000 provided information about pain; half of the books did not discuss it at all. Part of the problem is that there are relatively few known facts to discuss. Pain research is an orphan field that neither anesthesiology, neurology nor psychiatry can entirely claim as its own. As a result, research has been neglected and underfunded. The National Cancer Institute, for instance, spends little more than one-fifth of 1% of its $1.08 billion budget on pain research, even though the dread of terminal-cancer pain has become a national phobia.

The little that is known about pain and how to treat it is often misunderstood or ignored by physicians. A 1973 study by Psychiatrists Richard Marks and Edward Sachar of New York City's Montefiore Hospital found that nearly 75% of hospitalized patients receiving narcotics for moderate to severe pain failed to be relieved by the drugs. A review of their charts showed why. The dosages prescribed by their doctors were 25% to 50% less than what was needed to relieve severe pain. Records showed that nurses had further reduced these dosages substantially. The result: some patients were receiving less than a quarter of the pain medication they needed. According to the study, the problem was largely due to ignorance: most staff physicians simply overestimated the efficacy and duration of painkillers. They also overestimated the risks of narcotics, worrying excessively about the possibility of respiratory problems and addiction. "We've become a nation obsessed with drug addiction," says Bonica, "and this has led to a serious problem with underdosing." Congress is considering legisla-

JOE MCNALLY—WHEELER PICTURES

▶ For 16 years, Dr. Mat Bonomo, 81, suffered from the excruciating facial pain of trigeminal neuralgia. Doctors despaired, until advanced surgery finally ended his suffering. He awoke in the hospital, he recalls, and suddenly there was no more pain. ◀

❝ It was severe and disabling. I couldn't think, I didn't feel myself. ❞

tion to legalize the use of heroin to ease suffering by terminal-cancer patients (*see box*).

The twelve-year-old boy's sweet smile makes a poignant contrast to his otherwise pitiful appearance. His arms and legs are deformed and bent, as though he had suffered from rickets. Several fingers are missing. A large open wound covers one knee, and the smiling lips are bitten raw. He looks for all the world like a battered child, but only nature is to blame for his condition. He was born with an extremely rare genetic defect that makes him insensitive to pain. His fingers were either crushed or burned because he did not pull his hand away from things that were hot or dangerous. His bones and joints are misshapen because he pounded them too hard when he walked or ran. His knee had ulcerated from crawling over sharp objects that he could not feel. Should he break a bone or dislocate a hip, he would not feel enough to cry out for help.

Pain is the body's alarm system. It alerts us to the fact that something is harming us. It compels us to seek help when we need it. It immobilizes us when we are injured so that healing can occur. Pain has an evolutionary importance, says Anatomist Allan Basbaum, of the University of California, San Francisco. "Not to have pain at all is a disaster." But when the pain alarm fails to shut off, it ceases to serve a useful function. "Uncontrolled pain," Basbaum notes, "is also a disaster." In fact, it can do serious harm. The acute pain that follows surgery can, for example, sometimes interfere with a patient's ability to breathe, as well as contribute to nausea and add to the strain on the heart. Chronic pain often leads to an endless cycle of anxiety, depression, loss of appetite, profound fatigue and sleeplessness, all of which make the pain seem worse. Says Neurologist Kathleen Foley, president of the American Pain Society: "Chronic pain destroys lives."

Thelma Beauregard is a gray-haired, pleasant-faced woman of 67, who awoke one night four years ago at her home in Plymouth, Mass., with tingling and burning sensations running from her left elbow to her hand and down into her fingers. From then on, the slightest touch triggered sharp pain. Tests showed that Beauregard's ulnar nerve had been damaged at her left elbow. Her right elbow showed the same damage, although for some unknown reason she felt pain only on the left side. She has had three operations on the recalcitrant nerve, but at most these provided only a few months of respite. She has tried acupuncture, hypnosis, narcotics, electrical stimulation, antidepressants, heat therapy, ice-water therapy, all to no avail. Four years of suffering have conditioned her to cradle the stinging limb against her body, as though an invisible sling were holding it in place. The left hand has been used so infrequently that the muscles have visibly wasted away. Although the nails are beautifully manicured, the skin on her hand is paper dry. Daubing on lotion simply hurts too much. She looks weary. It is hard to sleep, she says, when "you feel as if you have a knife slicing into you."

Pain like Beauregard's is still something of a mystery to doctors. What caused it? Why did it arrive one night without warning? Why will it not go away? According to Neurologist Howard Fields of U.C.S.F., there is intriguing evidence that in many cases when pain persists for several months, changes of a relatively permanent nature occur in the nervous system, so that even if the original cause of the pain is removed, the sensation of pain continues. "We don't have any idea how that comes about," he says. Trying to reverse the changes, he observes, "may be something like trying to purge memory."

In simpler times, suffering like Beauregard's would have been attributed to evil influences. While early man had no trouble comprehending acute pain caused by injury, chronic pain was relegated to the occult realm of medicine men, sorcerers and shamans. Ancient Egyptians believed that chronic pain was caused by spirits, gods and the dead, but by the 16th century B.C. they had discovered a corporeal way to treat it. Opium is recommended as an analgesic in the *Ebers Papyrus*, an early reference work listing nearly a thousand prescriptions used in the times of the Pharaoh Amenhotep. Egyptians and some Eastern cultures believed that the physical locus of pain was the heart. This was debated among the ancient Greeks, until philosophers like Democritus and Plato concluded correctly that the pain-perception center is the brain. Greek scientists found support for this theory by discovering that the brain is connected to a network of two types of nerve fibers, one set controlling motion, the other, sensation. This knowledge was lost in the Middle Ages, and superstition again took hold. Only when taboos against dissection were lifted during the Renaissance did thinkers like Leonardo da Vinci once again understand pain in terms of the nervous system.

Most refinements of this understanding have come about in the past 20 years. Today scientists have a fair idea of what happens physiologically when, for example, the big toe collides with a large, solid object. Not surprisingly, the pain message originates at the point of contact (*see diagram*). It begins with the release of a number of potent chemicals that are normally stored in or near nerve endings for use on just such clumsy occasions. Among these chemicals are the mysterious substance P (for pain), prostaglandins and bradykinin.

▶ The joint-stiffening despair of rheumatoid arthritis has been with Maureen Hemmis for nearly 20 years. Just getting out of bed in the morning is an effort, and when the pain is at its height, every joint rages, swells and burns, hot to the touch. ◀

JOHN McDERMOTT

❝ The pain is everywhere. It's very much like being on fire. ❞

probably the most painful substance known to man—just a tiny amount inserted under the skin with a needle causes excruciating pain. These substances sensitize the nerve endings and help transmit the pain message from the injured region toward the brain. Prostaglandins also increase circulation to the damaged area, causing the swelling and redness known as inflammation. The purpose of this is to attract infection-fighting blood cells that will ward off any invading bacteria. Since the days of Hippocrates, doctors have been relieving pain with salicylic acid, a precursor to aspirin that was derived from willow bark, but only in the past 15 years have they understood that it works by inhibiting the production of prostaglandins. Tylenol (the most common brand of acetaminophen) works much the same way, as do popular prescription analgesics like Clinoril (sulindac), Motrin (ibuprofen) and Dolobid (diflunisal), often used to relieve arthritis and severe menstrual cramps.

The pain signal from the stubbing of the toe travels as an electrochemical impulse along the length of the nerve to the dorsal horn of the spinal cord, a region that runs the length of the spine and receives signals from all over the body. In a tall person, the distance from toe to dorsal horn may be more than one meter, and it can take about two seconds for the message to arrive. From there, it is relayed in a bewildering flurry of chemical messages to the brain, first to the thalamus, where sensations like heat, cold, pain and touch first become conscious. Then on to the cerebral cortex, where the intensity and location of pain are recognized. This final stretch of the pathway is the great terra incognita in pain research. Says Fields: "We can't put an electrode into the consciousness." In any case, it is the cortex that coordinates such highly sophisticated responses to pain as screaming "Ouch!" and rubbing the sore toe.

Toe rubbing, it seems, has its purpose, and one can get considerable relief by massaging or patting a sore area, just as one can relieve itching by scratching or slapping. In 1965 two researchers, Patrick Wall and Ronald Melzack, devised a brilliant theory to explain this effect: the gate-control theory of pain. According to them, only a limited amount of sensory information can be processed by the nervous system at any given moment. When too much information is sent through, certain cells in the spinal column interrupt the signal, as if closing a gate. Thus, it is reasoned, pain can be prevented from getting through the gate when there is competition from other sensations, like toe rubbing. The theory served as the basis for a now widely used analgesic therapy known as transcutaneous electrical nerve stimulation, or TENS. Electrodes are attached to the skin above a painful area, and a mild current is generated to compete with the pain signals. The stimulation of acupuncture needles is also believed to work, in part, by shutting the pain gate.

The gate-control theory, which has given rise to much new research, has been useful in explaining some of the puzzling psychological aspects of pain. Take for instance the familiar wartime phenomenon of a soldier so immersed in the heat of battle that he does not feel the mine going off beneath his foot. Or the football player so absorbed in making a play that he does not realize he has dislocated a shoulder until the game is over. Neurosurgeon Charles Poletti, of Massachusetts General Hospital, has his own favorite example. As a youth, fresh from the innocence of an all-boys boarding school, Poletti discovered the pleasures of necking with a Wellesley girl one wintry night. Only when he got up off the icy wall where they had been sitting did he feel an excruciating pain in his rump. "I was almost frostbitten," he says. "We must have been sitting there for 45 minutes, and I didn't feel a thing. Something in my system was suppressing that pain." ◆

About ten years ago, scientists in Scotland discovered what that something might be. Building on the work of American and Swedish researchers, University of Aberdeen Pharmacologists John Hughes and Hans Kosterlitz isolated powerful pain-blocking chemicals that occur naturally in the brain and spinal cord. The substances, called endorphins, switch off the pain alarm, rather like a key fitting into a lock. The locks are receptors on the surface of nerve cells. Opiate drugs like morphine and heroin also fit these locks, activating the body's pain-relief system. "All these years people had been using an extract of the poppy for pain relief," muses Fields. "Finally we have a plausible explanation for how it works."

The endorphin system is just one mechanism that can shut the gate to pain. Since the first endorphin was discovered in 1975, several types of natural opiates have been identified, along with other nonopiates produced in the body that can alter the pain message. Some of these chemicals, called neurotransmitters, not only are associated with pain but are also involved in emotional responses like depression. Doctors have learned that drugs developed to treat depression can also be used, in small doses, as analgesics. Ronald Dubner, of the National Institutes of Health, who spends most of his time trying to unravel the chemistry of pain and analgesia, has come to appreciate the fact that "pain is a complex experience that involves emotions, previous experiences with pain, and what the pain means to us at any given time." In short, the borderline between the physiology and psychology of pain is a blurry one.

He was a raw recruit from Parris Island, taking a beachhead in the Pacific. He was scared to death. Heavy enemy fire was killing his buddies all around him. When a shell burst near by, he felt an excruciating pain and the sensation of blood pouring down his leg. There was a call for a

BOB SACHA

▶ Thelma Beauregard's left arm, too sensitive to use or even touch, is cradled against her body, as if held in place by an invisible sling. For four years she has suffered in this way because of a damaged nerve in her elbow. ◀

❝ You feel as if you have a knife slicing into you. ❞

corpsman, and he was carried to a medical station, where doctors discovered he had indeed been hit—on his canteen. They sent him back out. More shells, more bombs. Suddenly, he felt a sharp pain in his head, hit the sand, rolled over and ran his hand across his forehead. Sure enough, there was blood. Again they carried him to the medical station. The doctor took some tweezers, picked out a few fragments of metal from his face, slapped on some adhesive bandages and sent him back to fight once more. By then, almost his entire company had been wiped out. For the third time, a shell burst near him. It tore off his leg. He did not feel a thing.

The young G.I. who told this story to Dr. Raymond Houde some 40 years ago declared that the worst pain he had ever felt was when his canteen got hit. The second worst: surface wounds on his face. "What pain signifies makes a big difference in how it is perceived," explains Houde, now chief of pain drug research at New York City's Memorial Sloan-Kettering Cancer Center. Fear, anxiety, stress, the expectation of disaster can make pain seem much worse than it is. For cancer patients, he explains, pain is often magnified

Heroin, a Doctors' Dilemma

Dear Committee:

Please do whatever you can to get heroin legalized for easing pain. As a nurse, I hear so many brave but torture-ridden people cry for relief from pain. So many patients just don't respond to morphine. Why must they scream and beg for relief?"

To Whom It May Concern:

My husband has been in constant pain with cancer of the lung, which has spread to the bones, the spinal column and the brain. Perhaps some of the people who are opposed to giving heroin should have to watch a person suffering day after day. I have watched my husband die by inches.

The letters pour into the Washington office of Judith Quattlebaum, 49. Again and again they tell a story that is all too familiar: the unremitting agony endured by a cancer patient, the frustrating sense of impotence felt by the family, and the apparent indifference of doctors seemingly more concerned about the latest advance in chemotherapy than about the comfort and dignity of their patient. Quattlebaum has been through it, having watched her grandmother slowly succumb to cancer. Seven years ago, she decided to act. Working out of her home, she organized the National Committee on the Treatment of Intractable Pain, now 6,000 members strong. Its mission: to win congressional approval for the use of heroin to relieve the pain of terminal-cancer patients.

Pain Relief Activist Judith Quattlebaum

Over the years, Quattlebaum's efforts have won considerable support in Congress, but several attempts to pass a heroin bill have been defeated. This year she is closer than ever. The Compassionate Pain Relief Act would authorize the use of heroin over a four-year evaluation period for hospitalized terminal cancer patients. It has been approved at the committee level in the House, and a companion bill has been introduced in the Senate. The bills have the support of such diverse political leaders as conservative Republican Barry Goldwater of Arizona and liberal Democrat Henry Waxman of California.

By and large, supporters have been persuaded by Quattlebaum's argument that heroin, which has been prohibited for use by U.S. doctors since 1956, is in many ways superior to morphine, the injectable narcotic most widely prescribed for cancer pain. According to Quattlebaum, heroin is faster acting because it is more soluble: "You can use half a cc of heroin, when you may have to use 20 times as much morphine." This is especially important in treating patients who are so emaciated that there is little muscle left in which to inject a drug, making a large shot extremely painful. Quattlebaum also suggests that heroin might prove helpful to those who are bothered by the side effects of morphine, which include nightmares, nausea, constipation and hallucinations. Finally, Quattlebaum points to the experience in countries like Britain, where heroin is available as an analgesic. "Where doctors have a choice," she insists, "both patients and doctors prefer heroin."

But many authorities disagree with Quattlebaum's views. The heroin bill is opposed by the American Medical Association, the American Hospital Association, the Reagan Administration and numerous medical experts on pain. One reason, and a factor in the past defeat of such legislation, is fear that medicinal heroin will find its way from the hospital to the street. But the larger question is whether patients will really benefit from the drug. "The evidence would suggest that heroin is the great non-issue of our day," says Kathleen Foley, chief of the pain service at the Memorial Sloan-Kettering Cancer Center in New York City. Foley, who has testified against the bill, challenges many of Quattlebaum's claims. While heroin is more soluble than morphine, she says, it is somewhat less potent than Dilaudid, a synthetic opiate already on the U.S. market. Nor is heroin likely to benefit patients who are allergic to morphine or are bothered by its side effects: new research by Cornell Pharmacologist Charles Inturrisi shows that once heroin enters the body, it is rapidly converted into morphine.

Perhaps most disturbing to many pain researchers is the prospect of large amounts of federal money going toward the preparation of heroin for medicinal use. "If the money and heat generated on the heroin bill were spent on developing new drugs and educating doctors on how to use the drugs we already have, patients would be a lot better off," insists Dr. Michael Levy, director of palliative care at the Fox Chase Cancer Center in Philadelphia. This view is shared by Dame Cicely Saunders, the English founder of the hospice movement, which popularized the use of heroin in Britain to relieve dying patients. The controversy over heroin, she says, is focusing attention away from the main issue, which is "the need to improve the general standard of care." In particular, she says, there is a need to ensure that a misplaced concern about addiction does not prevent doctors from prescribing large enough doses of opiates to relieve patients with advanced cancer.

Despite these arguments, some members of the medical community believe that heroin deserves the four-year trial proposed in the bill even if it helps only a handful of people. "We don't know if one patient in 10,000 will benefit," says Pharmacologist William Beaver, of Georgetown University, "but we ought to find out." —***By Claudia Wallis. Reported by Patricia Delaney/Washington and Ruth Mehrtens Galvin/New York*** because it is interpreted as "a signal of the disease having recurred, or some terrible complication setting in, or worse, that you are dying." Hope and encouragement can, on the other hand, make pain seem less than it is. During World War II, pioneer Pain Researcher Henry Beecher found that soldiers wounded during the bloody battle at Anzio needed far less morphine than did civilians with similar wounds. The presumed reason, now known as the "Anzio effect," was that for civilians the wounds were a source of anxiety; for soldiers they meant going home.

In many cases of chronic pain, the patient has something material or psychological to gain from suffering. Seattle Psychologist Bill Fordyce cites the case of a woman who developed lower-back pain when her physician-husband retired, perhaps so that he would still have someone to treat. Studies have shown that individuals with a pending lawsuit seeking compensation for injuries rarely get better until the suit is settled.

But when there is a powerful motivation to get well, pain can fade into the background. Dr. Jon Levine, of U.C.S.F., describes a woman whose hands and knees are swollen with arthritis but who continues to manage a San Francisco clothing store and has even run in the city's 7.6-mile "Bay-to-Breakers" road race. "I feel sure that she is experiencing the physiological impulses of pain," says Levine. "When you push her, she'll admit that there are certain things she tends not to do; for instance, she can't lift big bundles of clothing any more." But, he says, she refuses to use the word pain.

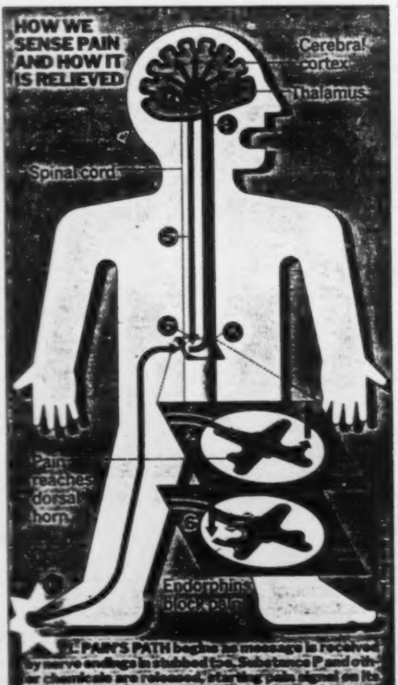
Some physicians are convinced that there are distinct characteristics that make some people more susceptible to chronic pain. Drs. David Richlin and Leonard Brand of Presbyterian Hospital in New York City list the following traits: low motivation, poor self-image, lack of pride in accomplishments, dependency on others.

Physicians have long known that if a patient is assured that he will recover and is treated with sympathy, his pain will often disappear. In the same way, a simple sugar pill, or placebo, prescribed in place of drugs, can have a curative effect. In fact, before the 20th century, when doctors relied on bleedings and all sorts of dubious nostrums, most of medicine was a type of placebo (Latin for "I will please").

Several studies have documented the efficacy of placebos. In 1955, Harvard Researcher Beecher found that sugar pills work one-third of the time in treating conditions ranging from headache and seasickness to wound pain. Levine and Fields of U.C.S.F. have reported that a placebo was capable of mimicking the effect of four to six milligrams of morphine, a mild dose, in patients suffering the pain of tooth extractions. U.C.S.F. researchers have also shown that the placebo effect is partly due to the stimulation of the body's endorphin system. When the action of endorphins is inhibited (by using a powerful opiate-blocking agent), placebos may not work.

Unfortunately, the psychological element in chronic pain has often led physicians to dismiss their patients' complaints. Says Fields: "Many doctors and nurses believe that if a person responds to a placebo, the pain can't be very bad. This is a terrible mistake." Only about 5% of chronic pain patients are hypochondriacs or hysterics, according to Psychiatrist Anthony Bouckoms of Massachusetts General Hospital. "Pain itself is the reason people suffer; it is not psychopathology," he avers. And yet the most frequent question Bouckoms hears from pain patients is: "Tell me, doctor, is it all in my head?"

She thought she had lifted something too heavy for her during the family's move from South Carolina to New York. But months later, the pain was still getting worse. "Oh, Mama," her two children would say, "try to forget it." She went to two orthopedic surgeons and a rheumatologist. No one could find anything wrong. "If you get out and run, you'll feel so much better," her husband suggested. But she knew she was unable to run. She began to believe she was making up the pain. "You want to hide your face. Everybody gets tired of people being ill." After two years, convinced that cancer was the only possible explanation, she persuaded a doctor to take a chest X ray. "That's when they found the whopper," she recalled recently before her death. The pain had been real, and so was the large tumor in her lung.



1. PAIN'S PATH begins as message is received by nerve endings in stubbed toe. Substance P and other chemicals are released, starting pain signal on its way as an electrical impulse. 2. Message is transferred to the dorsal horn in the spinal cord. 3. It is relayed to the thalamus, a sensory center in the brain, at which point one first becomes conscious of the pain. 4. It then travels on to the cortex, the brain's outer layer, where the location of the pain and its intensity are perceived. 5. PAIN RELIEF begins as signal from the brain descends via the spinal cord. 6. In the dorsal horn, chemicals like endorphins are released to diminish the pain message from the toe.

People with chronic pain often wind up on a medical merry-go-round: psychiatrists tell them that their problem appears to be physical; internists and surgeons tell them they ought to have their head examined. Western doctors, trained to cure acute illness, are often frustrated by patients with vague pain that refuses to go away. So are the families, who quickly tire of hearing complaints. Dejected, guilt-ridden and increasingly isolated, many pain patients eventually seek care outside standard medicine: herbal treatments, chiropractic, faith healing and, too often, quackery. Says Fields of U.C.S.F.: "They fall through the cracks."

Many of these people are now finding their way to multidisciplinary pain clinics, of which there are about 150 around the world. The idea of combining the skills of doctors in many disciplines to deal with pain was pioneered by Bonica at the University of Washington Medical Center's Clinical Pain Service in Seattle (*see box*). Treatment at a pain clinic begins with a thorough work-up, including physical, psychological, neurologic, orthopedic, radiologic and laboratory examinations. If a physical problem is detected—a tumor pressing on a nerve, a slipped disc—surgery or some other appropriate treatment will be recommended.

However, in general, pain clinic patients have less concrete causes for their suffering. For them, the first step often is to be weaned from whatever narcotics they have been taking for relief, substituting methadone if necessary and offering psychological counseling. Doctors tend to frown upon the use of narcotics and muscle relaxants like Valium because they may add to a pain sufferer's debilitation.

The first line of treatment is the "simple analgesics": usually aspirin and acetaminophen. Even cancer patients can sometimes find relief in a bottle of aspirin. A number of other nonnarcotic drugs have proved useful in treating specific kinds of pain. Migraine Sufferer Blaine Anderson, 31, of San Francisco had tried everything from strong doses of codeine to psychic counseling to relieve pain "that felt like someone was tightening my head in a vise." She finally found relief with calcium channel blockers, originally developed for heart patients. Antidepressive drugs like the tricyclics are frequently recommended for shingles and chronic lower-back pain. Antiseizure medications like Dilantin, commonly used to treat epilepsy, can help calm the spasmlike facial pain of trigeminal neuralgia.

Physical therapies are helpful not only in relieving pain, but in helping patients get on with their lives despite it. Such treatments, including exercise, whirlpool and massage, are particularly useful for back pain, which is often compounded by muscular weakness. Before Maureen Brennan, 37, of Helena, Mont., arrived at the Seattle pain clinic for treatment of her back problem, she was confined to a wheelchair and was spending $180 a week on narcotics, sleeping pills and antidepressants. An accident four years earlier had ruptured five discs in her spine. Seven operations had failed to relieve the pain, and her weight had dropped from 160 lbs. to 81. After Seattle's three-week program of intensive physical therapy and psychological counseling (at a cost of about $10,000), Brennan was walking briskly down the hallways. "I have the same pain I came in with," she says, "but you're busy here. It's like working an eight-hour day." The hard work makes it easier for her to sleep, and Brennan plans to get a job for the first time since her accident. Observes Clinic Psychologist Fordyce: "People who have something better to do don't hurt as much."

Hypnosis, biofeedback and TENS stimulation, once considered "fringe" methods of treatment, have earned respectable places in the pain clinic arsenal. Acupuncture, which tends to give only temporary analgesia, has a smaller following. According to Bonica, TENS provides significant short-term relief for 65% to 80% of patients and long-term relief for 30% to 35%. The electrical stimulating devices are widely available at costs ranging from $60 to $400. Biofeedback, in which electronic devices are used to teach patients to relieve tension, has proved helpful for a number of ailments, including one of the most perplexing problems in medicine: phantom limb pain, the often agonizing sensations that amputees "feel" in missing limbs. Psychophysiologist Richard Sherman, of Dwight David Eisenhower Army Medical Center in Fort Gordon, Ga., has

Pain Relief's Founding Father

He uses an aluminum wrist cane to walk across the expansive living room of his Mercer Island, Wash., home. He walks surprisingly quickly, despite the arthritis and 22 operations that have left his left leg 1½ in. shorter than his right. He cannot stand for more than seven minutes at a time without great pain. Says Dr. John Bonica, 67, onetime professional wrestler and a prime mover in establishing the study of pain as a science: "If I wasn't as busy as I am, I would be a completely disabled guy."

Those millions of Americans who suffer from chronic pain have cause to be thankful for Bonica's tenacity. He has helped make much of the medical profession aware of both the compassion and the specialized approach needed to deal with the agony of pain. Twenty-three years ago he helped found the University of Washington Medical Center's Clinical Pain Service, in Seattle, which has become a model for similar clinics across the country. Here, sufferers from chronic pain can be examined by medical specialists in a variety of fields, from orthopedics to psychiatry, in an attempt to isolate the often mysterious causes of a patient's constant agony.

Bonica at work: "I've seen patients, and I've cried"

Bonica's grizzled features and no-nonsense bedside manner belie the depth of his feeling for the suffering. Recently, when talking of treating a woman in Saudi Arabia whose face had literally been eaten away by cancer, his eyes began welling with tears. He spoke of reading her hospital chart and realizing that she had been enduring needless suffering because her doctors had given her inadequate doses of pain-killing drugs. "I've seen patients and I've cried," he admits. "It stresses me emotionally to see a patient in severe pain who could be relieved and is not." And yet, according to his associates, Bonica never discusses his own pain. Says Bill Fordyce, a psychologist at the Seattle clinic: "He's a tough old son of a gun."

The need for a radical new approach to the treatment of pain became obvious to Bonica while serving as chief of anesthesiology at Fort Lewis, near Tacoma, during World War II. Traditionally, pain therapy had not been regarded as an area for specialists, and the treatment of choice was drugs, usually morphine. But combat produced a record number of patients with severe trauma. The war in the Pacific alone regularly filled the 7,700 beds at the military hospital at Fort Lewis with troops enduring amputations, nerve injuries and multiple fractures. Bonica became responsible for finding ways of alleviating their suffering.

Desperate for answers, he began consulting with other doctors: internists, neurosurgeons and, for some cases, dentists. He recalls: "There was no one else in the area doing pain work. I realized I didn't know anything about pain. There was little information available, and that was scattered throughout the medical literature." Out of Bonica's experiences with the wounded came his theory that the treatment of pain must borrow from a number of medical specialties.

Bonica is now semiretired, but he still writes and lectures. A singular contribution continues to be his personal example that a normal existence is possible despite the constant presence of pain. Although he has had eleven operations to correct arthritic deformities in his hips, he scuba-dives, both in Hawaii and off the coast of Filicudi, the small island near Sicily where he was born. His only concession to infirmity is that he no longer water-skis daily. And the days when he worked his way through the New York University School of Medicine as Johnny Bull Walker, professional wrestler, are but a distant memory. To his many colleagues and former patients he is still a vital presence. So much so that every year the University of Washington School of Medicine holds a John Bonica night. Says Dr. John Loeser, the director of the Seattle clinic: "Two hundred people come from all over simply to have dinner with John."

—*By Dick Thompson/Seattle*

▶ At the age of 28, Charles Lanning was facing cancer for the second time in his life. He was gripped by tension until Lucanne Bailey, a music therapist, showed him the calming influence of melody. For Charles, peace has come through the strings of his guitar. ◀

❝ You have to be able to take your mind off pain. I can lose myself in the music. ❞

found that the pain, which afflicts about 80% of amputees at one time or another, is sometimes due to muscle spasms in the stump. When Sherman teaches patients to relax the affected muscles through biofeedback training, the sensations in the phantom limb usually disappear.

For cancer patients, more drastic measures are often needed. According to Kathleen Foley, chief of the pain service at Sloan-Kettering, only about one-third of cancer patients suffer severe pain. With these, the tumor is the cause in 65% of patients, either because it impinges on nerves or because it releases chemicals that affect the nervous system. An additional 30% have pain resulting from the treatment (for example, chemotherapy). Cancer of the pancreas and of bones can be particularly painful because of the sensitive nerves in or near these organs. In the vast majority of cases, cancer pain can be alleviated with drug therapy, including narcotics like morphine or methadone. These may be administered by mouth, by injection into the muscle or directly into the spine via surgically implanted catheters. An implantable morphine pump that provides a continuous infusion of the drug is being tested for use by cancer patients. Unfortunately, patients may develop tolerance to narcotics, and their doctors often fail to provide high enough doses to keep pain at bay.

Surgery is the last recourse of the pain patient. "I spend an awful lot of my time telling people not to have it," says Neurosurgeon Poletti of Massachusetts General Hospital. Although operations to destroy nerves can provide immediate relief, the benefits rarely last more than six months to a year and may be followed by intense, burning pain that is worse than the original complaint. Surgery is often reserved for terminal-cancer patients. For such patients, neurosurgeons have devised delicate operations to cut nerves causing local pain, and even to sever nerve tracts in the spinal cord and brain. In some instances, rather than destroy nerve tissue, doctors can implant electrodes into the spinal cord or brain. The patient can then use an external transmitter to stimulate nerves directly when he feels pain.

Surgery may also be appropriate in cases of the severe facial pain known as trigeminal neuralgia, or tic douloureux. For 16 years, Dr. Mat Boname, 81, of Oxford, N.Y., suffered this excruciating pain, despite the efforts of five doctors. Finally, a delicate operation in which electrically induced heat was used to destroy a facial nerve brought relief. The effect was immediate, he says: "When I came up from the operating room, I had no pain at all."

As the understanding of the pain pathways improves, researchers have great hopes of discovering better methods of analgesia. The search is on for a narcotic that works on the body's opiate receptors without provoking the side effects of morphine. Meptazinol, a drug developed in Britain by Wyeth Laboratories, may be a good candidate. "I think this could be the first in a new generation of opiates," says Sloan-Kettering Neurologist Gavril Pasternak. Scientists elsewhere are experimenting with drugs that activate the body's nonopiate painkilling systems. Such drugs are needed by patients with diseases like shingles, which does not respond to opiates. Levine at U.C.S.F. is enthusiastic about the analgesic properties of the chili pepper, which, like oil of cloves and ginger, contains a substance that causes sensory nerves to release substance P. Though this causes a burning sensation at first, repeated application produces numbness. Levine believes that capsaicin may eventually prove useful in treating arthritis.

Pain Pioneer Bonica believes that drugs are not the entire answer, and he envisions a day when people will look to their own innate mental powers to relieve suffering. Says he: "I don't think it takes too much scientific license to say that we will discover mental activities that can produce specific analgesia. In ten or 15 years, perhaps we can begin to teach people to control their own pain." The mystical swamis of India have long used what Bonica suspects is "a form of self-hypnosis" to recline peacefully on a bed of nails.

An inner peace can also be induced by music. Lucanne Bailey, who is a music therapist, is using melody and harmony to relieve the suffering of cancer patients at Sloan-Kettering.

Perhaps the only thing worse than having cancer is having it again. As a boy of ten, Charles Lanning fought and won a long, hard battle against Hodgkin's disease. He was free of the disease for years and was beginning to establish himself as a graphics designer in Alaska when, on the eve of his 28th birthday, he learned that he would again have to fight for his life: he had developed another, unrelated form of lymphoma that would prove even more difficult to treat. He returned to Sloan-Kettering six months ago for treatment. When Lucanne Bailey found him, he was in considerable pain, particularly in his back. Says Bailey: "He was very tense and guarded about his feelings, very bottled up." She offered to play him music and asked him to choose the songs, hoping "to give him a greater sense of being in charge. He was missing a sense of control in his life and over his disease." Lanning appeared to select songs that reflected his feelings. One favorite: Mr. Bojangles, *a song Bailey describes as "sorrowful, about a lonely man, in and out of jail, who loves to dance and drinks a bit." Seeing that the music seemed to comfort her husband, Lanning's wife Tammy bought him a guitar, which he began to play for the first time in years. "In spite of all the medication, you have to be able to take your mind off pain and on to other things," Lanning told his mother. "I can lose myself in the music." He has continued his playing at home, and has begun to sing with his wife. At a time when she is doing so much for him, Bailey observes, "it is a way for him to give something to her."* **—By Claudia Wallis.**

Reported by Ruth Mehrtens Galvin/New York and Dick Thompson/San Francisco